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A Reporter at Large

- An Alaskan Town Is Losing Ground—and a Way of Life

An Alaskan Town Is Losing Ground—and a Way of Life

For low-lying islands like Kivalina, climate change poses an existential threat.

By Emily Witt



Typhoon Merbok began forming in the central Pacific Ocean during the second week of September. Fuelled by unusually warm waters, the storm system moved north and east toward Alaska, and by the time it crossed the Aleutian Islands weather buoys were recording forty-foot waves and winds of seventy-five miles an hour. On September 17th, Merbok, which had been downgraded to an extratropical storm, reached the Yukon-Kuskokwim Delta and the Bering Sea inlet of Norton Sound, one of the strongest storms to hit the area in fifty years. In the barrier village of Shaktoolik, Merbok wiped out a protective berm. In Golovin, streets were flooded with seawater and sewage. A house floated up a river in Nome, and a sixty-two-pound mammoth femur was unearthed near Elim.

As Merbok headed north, residents of Kivalina, an Inupiat village of about four hundred and fifty people situated on a fragile barrier island eighty-three

miles north of the Arctic Circle, received a National Weather Service report, warning of winds of up to sixty-five miles an hour. On Friday, Janet Mitchell, a village elder and a field reporter for Kivalina's volunteer team of first responders, drove out to the beach on her four-wheeler with her phone. Mitchell posts videos on TikTok and Facebook under the name Storm Swan. That afternoon, Mitchell recorded video of the rising waters of the Chukchi Sea and the sound of roaring wind. "Oofta!" she captioned her footage. "Batten down the hatches!"

For years, Kivalina has been cited—like the Maldives, in the Indian Ocean, or the island nation of Tuvalu, in the Pacific—as an example of the existential threat posed to low-lying islands by climate change. In the past two decades, stormwaters have overtopped Kivalina at least once, threatening lives and infrastructure. In 2003, the Government Accountability Office reviewed nine Alaskan villages and identified Kivalina as one of four in "imminent danger." (Of those four, only one, Newtok, a Yupik village near the Bering Sea, has been able to move some of its residents.) A more recent report designated Kivalina as one of seventy-three Alaska Native villages threatened with destruction because of erosion, flooding, and permafrost degradation. On a visit to the state in 2015, President Barack Obama flew over Kivalina and posted a photograph of the island on social media from the air. "There aren't many other places in America that have to deal with questions of relocation right now," Obama wrote, "but there will be." He described what was happening in the village as "America's wake-up call."

Seven years later, Kivalina's move is still mostly in the future, even though the island continues to lose ground. Building housing is an expensive and laborious process in the remote Arctic, and no single federal agency is responsible for relocating communities facing environmental threats. After more than a decade of navigating government bureaucracies, tribal members successfully lobbied for the construction of a bridge from Kivalina to the mainland. Its completion, in 2021, created a vital evacuation route where once the only possibility of escape was by water or air. The bridge is part of an eight-mile road that zigzags across the tundra, which is covered in snow in winter and prone to flooding in spring and fall. It ends at the foot of a large hill, where a newly constructed school forms the heart of the future village. More years are likely to pass before homes are built there, even as

engineers predicted, in 2013, that Kivalina will be fully under water by 2025. The new site is a desolate and rocky place, but, at an elevation of a hundred and twenty-five feet, it is a safe distance from Kivalina's receding beach and eroding riverbanks. Until the community can move inland, residents live with the worry that the right storm at the right moment could wipe out everything.

With Merbok, at least, the waters of the Kivalina Lagoon, which separates the island from the mainland, rose but did not flood their banks. A rock revetment, completed in 2010 on the island's sea side, held strong. On the lagoon side, Janet Mitchell recorded footage of a bulldozer shoring up a house at risk of losing its foundation, then posted a glimpse of calm seas. Kivalina had made it through one more storm.

I arrived in Kivalina a few days after Merbok. The commercial jet from Anchorage to the Arctic city of Kotzebue carried a mixture of Alaska Native families, seasonal mine and construction workers, and engineers wearing canvas pants and *XTRATUF* boots. The plane to Kivalina was a vintage Cessna, and the passengers sat in a single column on its right side. The seats on the other side were loaded up with cases of Pepsi and boxes of Puffs Ultra Soft tissue. Like dozens of similarly isolated villages, Kivalina is not accessible to the rest of Alaska by road or connected to a regional electric grid. Electricity is produced by a diesel generator, and fuel is delivered by barge before the sea ice forms. For the rest of the year, everything arrives by air.

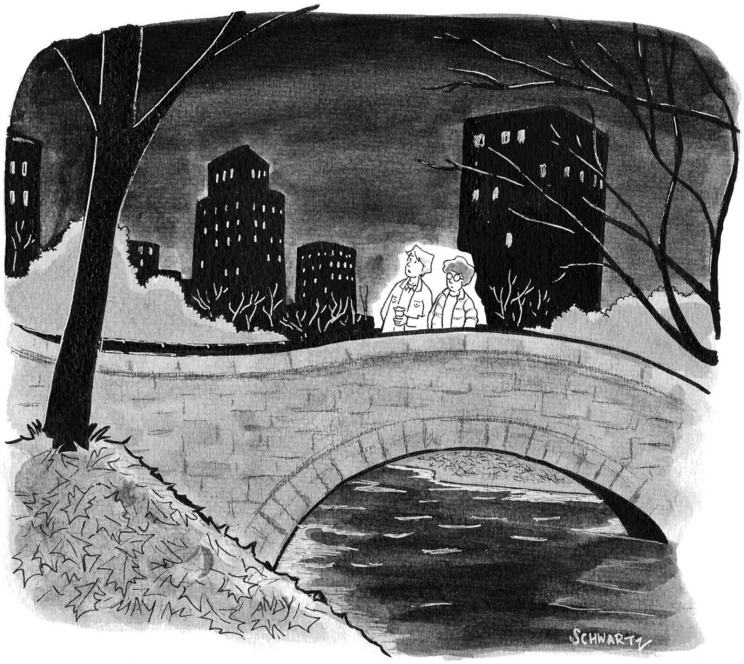
We hugged the shoreline as we flew north above the treeless expanse of the tundra, with its boggy tuffets, its sinkholes and ponds, its snaking rivers, the places where the black soil of the permafrost has crumbled into the sea. At times, the tundra's agatine surface took on an almost fractal pattern of brown, gold, and green. Midway through, we passed over a cluster of red and white storage buildings by the sea. This was the port from which the Red Dog Mine, one of the largest producers of zinc concentrate in the world, has shipped millions of tons of processed ore since it opened, in 1989. Its haul road—which runs from the De Long Mountains to the port—was the only rectilinear imposition across the vast landscape.

After thirty minutes, the village of Kivalina appeared: eighty-odd houses spread across twenty-seven or so acres on the bulbous southern end of a barrier island between the mouths of the Kivalina and the Wulik Rivers. The island, which stretches five and a half miles, is only seven hundred feet wide in most places, and maxes out in altitude at ten feet above sea level.

The Cessna flew over the village, then banked, circled, and nosed into an easy descent onto Kivalina's gravel runway. Several all-terrain vehicles and a pickup truck were waiting in a spitting rain. The passengers got off, the boxes of goods were passed down, then the pilot climbed back into his seat, turned his propellers on, and flew away.

One afternoon, I set off to visit Janet Mitchell at her house, a wooden building in the center of the village. It was a brilliantly sunny day, with clear skies and temperatures in the mid-forties. The equinox had just passed; the snow that blankets the island for most of the year had not started falling, but the change of seasons was in the air. I walked past houses with snowmobiles parked haphazardly outside, and dogs chained to fenceposts. A family were putting away a harpoon, used to hunt beluga in the summer, and readying their boat for seining, the net fishing that happens in the fall. Another family rolled past on A.T.V.s. They were bundled up in parkas, with rifles strapped to their backs, heading inland to look for moose and caribou. (Before the bridge was built, people had to travel upriver by boat to hunt in the interior.)

The caribou, part of the Western Arctic herd, were late showing up this year, a much discussed subject in the village. The seining had also been delayed. In Kivalina, fish are traditionally left to age on the riverbanks for at least several days before being eaten or stored in freezers. ("The Western people call them stinky fish," a villager explained to me, "but here we call them ambrosia.") If the fish are caught too early in the season, before the frost, they spoil. The fall had been warm, and the thin layer of ice known in Inupiat as *qinu*, which used to begin forming over the lagoon in late August, had not yet appeared by the last week of September. The puddles in the road which froze overnight would melt by midmorning.

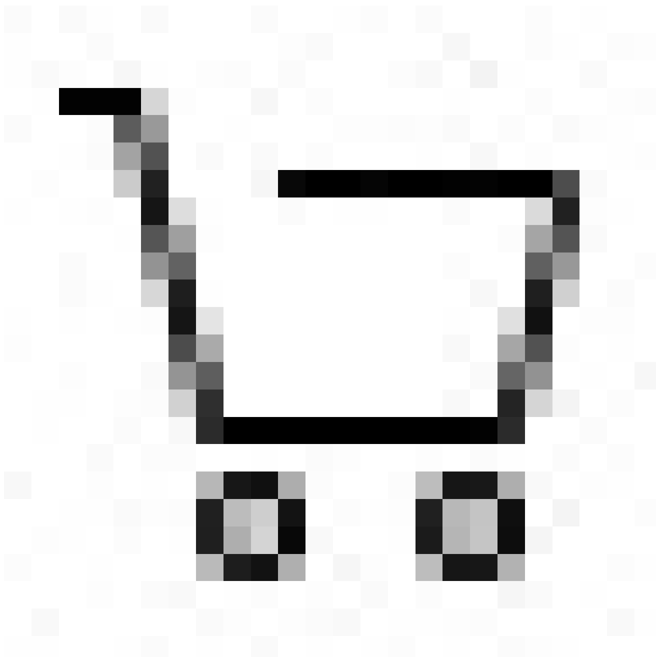


"I can't believe it's only four-thirty and it's already dark, the year's already almost over, and I'm already in my forties."
Cartoon by Benjamin Schwartz

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Mitchell, who has gray hair and a friendly demeanor, welcomed me into her living room. Dressed in a black T-shirt and sweats, she was seated on a couch beneath a large photograph of her grandfather Clinton Swan, a whaling captain, a member of the tribal council, and a minister in the Episcopal Church, from whom she had inherited the house. In the picture, the elderly Swan looks dapper in a red lumberjack shirt, suspenders, and nineteen-fifties-style glasses with black-topped rims; in his left hand, he holds a small whale's tail carved out of walrus ivory. The Swans are one of several families who are active in village politics. (Captains of whaling crews, which are typically organized by family, are also integral to the community, even though a bowhead whale has not been caught in Kivalina in more than two decades.) Above the photograph, wolf and wolverine furs were draped over a clothesline—they belonged to Mitchell's mother, who died in 2019. A computer and headphones lay on a coffee table, and on a shelf was a large pile of hard drives, evidence of Mitchell's years of digital documentation, which include audio recordings with older relatives and video footage of major storms.

Mitchell grew up in a sod house on the site of the house she now lives in, part of a multigenerational compound presided over by her great-grandmother Regina, who was born in 1870. In the summer, the family would move into tents on the beach, where it was much cooler. It is common

in Inupiat families for grandparents to adopt a grandchild to help them around the house as they age. When Mitchell was eight or nine, her grandmother chose her to come live with her and her husband, just as today Mitchell's grandson Aaron lives with Mitchell. Her youth was one of physical labor—chopping wood, lugging ice, and hanging the slabs of *ugruk*, or bearded seal, that her grandmother butchered. Mitchell's family followed the subsistence food-gathering patterns of the seasons, and in the spring she would sometimes join her father's whaling crew at their encampment on the ice, to hunt bowhead whales. Mitchell reminisced about the years when the arrival of *qinu* marked the time to dig whale out of underground caches, "the permafrost freezers, if you will," she said. "That's when they would pull out the *maktak* and distribute it to the whole village. They always waited for *qinu*."

According to oral histories recorded in the late nineteen-sixties and early nineteen-seventies, the region that Kivalina occupies today was known in the nineteenth century as Kivalliñiq, and the people who inhabited the area, the Kivalliñigmiut, were considered their own nation. Until the mid-nineteenth century, they had only minimal contact with Westerners. Then American whalers came to the region, decimating the bowhead and walrus populations and contributing to the spread of deadly epidemics. The Kivalliñigmiut nation was scattered by famine in the early eighteen-eighties, but for Mitchell's great-grandmother's generation the barrier island of Kivalina remained a summer base from which to hunt marine mammals: *ugruk*, walrus, and beluga whales. In late summer and fall, when the caribou arrived and fish migrated upriver, families would travel inland, setting up camp with winter supplies of meat and oil.

Kivalina remained a sparsely populated seasonal hunting ground until 1905, when the federal government constructed a school there. Like many Alaska Native villages situated on shorelines and riverbanks around the state, Kivalina was presumably chosen because of its accessibility by water. The government, in mandating the attendance of the region's children, began a project of forced settlement in a place that was seen as precarious from the outset. Mitchell maintains a history of Kivalina on a Web site, which references the oldest known written request for relocation. A teacher named Clinton S. Replogle wrote an official report in 1911: Kivalina "is very beautifully situated when the weather is nice and calm, but when the wind

blows from the south it raises the water in the ocean until it sometimes almost comes over the banks. . . . We believe that to move would be the wiser if not the safer plan."

The subject of relocation was raised again many times during the next century. In 1963, the tribe voted on the issue, and a split vote resulted in the community's staying on the island. It was in the nineteen-seventies that the village's wooden houses replaced the sod ones. There were other changes, too. Snow machines (as snowmobiles are known in Alaska) replaced dogsled teams. Outboard motorboats and Hondas (regional shorthand for the four-wheel A.T.V.s that everyone in Kivalina uses to get around) replaced skin boats. Stove oil replaced driftwood for heat. An airstrip, completed in 1960, connected Kivalina by air to the rest of Alaska and beyond. Electrification arrived in 1971.

Today, Mitchell works as the shareholder-relations coördinator in Kivalina for the *NANA* Regional Corporation, which is owned by Inupiat shareholders who live or have roots in Northwest Alaska. The corporation was formed after the passage of the Alaska Native Claims Settlement Act, in 1971, which ceded some forty million acres of land in Alaska to Native-owned corporations (in exchange for their relinquishing claims over the rest) and offered Native Alaskans a stake in the sale of oil and mineral leases on their land. The act gave Native Alaskans greater self-determination, but it also linked their economic well-being to the commercial exploitation of their lands.

By the nineteen-nineties, as the population grew, discussions about relocation in Kivalina focussed more on overcrowded homes and a lack of water and sewer systems. But in the early two-thousands a series of weather events made the need to move a matter of urgent survival. It has become a well-known fact that the Arctic is warming nearly four times faster than the rest of the planet, making the weather increasingly unfamiliar. Some shifts were gradual, like the loss of sea ice: according to one study, the ice-free period in the Chukchi Sea increased from three months to five months between the nineteen-eighties and the early two-thousands. Others were sudden: Mitchell recalls the first time she saw lightning over the village, around 2010. (Lightning needs warm air to form.) "We were running outside because we didn't know any better," she said. "We had never seen lightning

before." When she submitted a video still to the local weather station, she was asked if it was real. Thunderstorms have now become more common.

Mitchell is one of many village residents who cite as a turning point October, 2004, when forty feet of shoreline eroded during a single storm. "It was pretty intense, man," she said. "The water was coming to the school. The principal's trailer was on the ocean side, and it was hanging over the edge." Two years later, the village built an emergency erosion-control barrier, but a storm later destroyed it, with water coming within six feet of the electricity plant's oil tanks.

Mitchell still remembers the day in 2005 when, at the height of summer, the temperature, which typically averaged in the mid-fifties at that time, topped ninety degrees. "I don't recall anyone making a big deal out of it, but this is the freaking Arctic!" she told me.

Between 1992 and 2010, the village's tribal administrator was Mitchell's older sister, Colleen Swan. Mitchell is in awe of her sister, whose advocacy, forming connections with activists in the Lower Forty-eight and welcoming journalists who wanted to visit, helped put Kivalina's climate-change story on the map. It was Swan, Mitchell told me, who encouraged the villagers to document the weather. The previous day, I had met Swan in the offices of the Kivalina City Council, where she was doing volunteer work for the Fire Department and the search-and-rescue team. Where Janet is open and vivacious, Colleen is more taciturn. Swan described the 2004 storm as the impetus for her desire to hold someone responsible for the situation Kivalina finds itself in. "I wanted to file a lawsuit against someone so bad for that land failure," she told me. "Our elders were saying they've never seen anything like that."

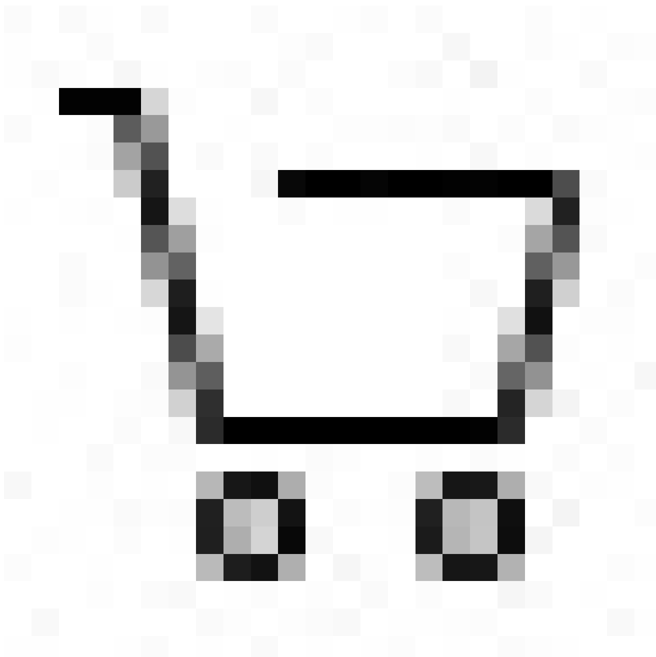


"Let me look at your hand."
Cartoon by Frank Cotham

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In 2008, seven years after Swan met Luke Cole, a lawyer from the Center on Race, Poverty, and the Environment, in Kotzebue, the village sued a consortium of twenty-four oil, energy, and utility companies, alleging damages from climate change. The court dismissed the lawsuit, citing, among other reasons, the difficulty of holding companies responsible when "virtually everyone on Earth is responsible on some level for contributing to such emissions." The lawsuit also alleged that the companies had conspired to mislead the public about the impact of fossil fuels. For Swan, it was important to make the statement that Kivalina understood the forces that had put it in such a precarious position. "We're more educated now than our people ever were in the past," Swan said. "We have access to news, we have the education we need." And, she added, "it was not our people's decision to move to this little sand spit."

I n Kivalina, I stayed at an after-school club, which, in the absence of a hotel or a guesthouse, has a spare room for visitors. The island has no playground, and the BnG, as the club is known, gives kids a warm and informal place to hang out after school. It has an Xbox, games, books, and a basketball hoop. Hand-painted signs on the wall read "*Do Not Bully Be Nice*" and "*Be Good, God is Watching*." When school let out, the children arrived in shifts, the younger ones in the afternoon and high schoolers during the evening. In the morning, when the BnG was empty, I would lie in my sleeping bag and

listen as crosstalk came through on a VHF radio, which acts as a kind of Facebook wall—a place for villagers to exchange birthday wishes, ask if anyone is selling moose meat, or announce that the Pepsi shipment has come in.

"Where you're walking, it used to be graves," a woman said to me one morning, as I let myself out of the clubhouse. She explained that the black gravel road on which we had stopped to chat was built on the village's former cemetery; as the island lost width through the years, a new cemetery opened near the airstrip.

I was heading to a meeting of the Kivalina *IRA* Council. *IRA* is the acronym for the Indian Reorganization Act, which, in 1936, recognized the governing bodies of Alaska Natives. The Native Village of Kivalina is a federally recognized tribe. In Kivalina, at least, "the *IRA*" now refers both to the tribal council and to its headquarters, a green, two-story wooden building that also houses the city council.

In a wood-panelled room, members of both councils, mostly age sixty and above, sat around a conference table to discuss the next phase of relocation with engineers from an Anchorage-based firm. On the table were bottles of Vitaminwater and mini cans of Pringles, and also tangerines and bananas. Official visitors often bring fresh fruit.

The debate that morning, which began after a moment of prayer, was about where to put the relocated village's landfill and a new dump site for the makeshift toilets known regionally as honey buckets. These are plastic pails lined with garbage bags and fitted with toilet lids. Kivalina has piped water only at its school, its health clinic, and the communal laundromat and bathhouse called the washeteria. Instead of flush toilets, most homes use honey buckets. Waste is emptied into communal receptacles, then taken to a site at the edge of town. In addition to many sanitary risks, the frustration of living in such conditions prompted one villager to describe them as "the dark ages."

That the relocated village will finally give Kivalina residents running water and sewer services is a large part of its great promise, but the council members reluctantly conceded to the engineers that a new honey-bucket

dump site would probably be necessary anyway. It could be years before a new sewer system was built. The discussion then turned to the placement of the landfill, in an area known for its salmonberries. “I sure would hate to look at that dump site and smell it when I’m picking berries,” a council member said. Others expressed concerns about flooding.

The plans weren’t ideal, but the mood was one of resignation: the sooner the new landfill was approved, the sooner the village could relocate. The council members voted in favor of going ahead.

Relocation in a place like Kivalina does not proceed in a linear fashion. Funding comes from a wide range of government agencies, each with its own processes. In Kivalina, all of this is managed by Millie Hawley, the *IRA* tribal administrator. Hawley is a pragmatic and blunt woman of sixty with glasses and gray hair trimmed in a neat bob. A sign posted outside her office reads “*IN A TELECONFERENCE MEETING ALL DAY, NOT IGNORING YOU, MILLIE*.”

After tribal officials, who are elected, arrive at a consensus about what to do, it is up to Hawley and her staff to keep track of the complicated logistics of the village’s move. Most of the construction funds for the new school came from the state after the settlement of a lawsuit, filed by parents in the Yukon-Kuskokwim Delta in 1997, which claimed that Alaska’s method of backing school construction discriminated against rural students. Money for the road came from the Northwest Arctic Borough and the Alaska Department of Transportation and Public Facilities. Financing for the housing at the new site has yet to be determined. In 2022, the U.S. Government Accountability Office recommended creating a federal entity to coördinate efforts to relocate Alaska Native villages, which would, in theory, make the lives of administrators such as Millie Hawley easier.

In the meantime, there are obstacles all around. A house in rural Alaska can cost as much as five hundred thousand dollars to build, in part because skilled laborers like electricians and plumbers typically must be flown in from elsewhere. Getting materials here is onerous and expensive; sourcing them is another challenge. Much of the existing housing in Kivalina is incompatible with the Arctic climate and riddled with black mold. Building on permafrost requires gravel pads that protect the ice from melting, and

aboveground pipes. One calculation estimated the cost of moving Kivalina to be as high as four hundred million dollars, or almost a million dollars per resident. The village does not have a conventional tax base. A majority of people in Kivalina are on public assistance, and many residents supplement income earned from part-time or seasonal labor with food they acquire through hunting, fishing, and harvesting. Houses tend to be transferred to family members rather than purchased through the real-estate market.

Moreover, the problems faced by Kivalina are the same ones facing as many as a hundred other villages around Alaska. A report by the Alaska Native Tribal Health Consortium and other organizations concluded, "The magnitude and severity of this problem can be difficult to comprehend. In jeopardy are not just buildings, but the sustainability of entire communities and cultures." And compelling residents of Alaska Native villages to move into cities far from their land risks perpetuating the United States' legacy of genocide and the forced movement of Native peoples, and could subject the displaced to a range of poor outcomes, including homelessness, racial discrimination, and a loss of social support systems.

"At some point, the state and federal agencies did suggest we move to different towns," Hawley told me. "It was, like, 'Hello?' That's not going to happen. We're our own tribal community. We have our own ways, our own customs." Hawley said that in another village, even one in the same borough, she would be an outsider. "We're just family, one big family." In the village, children from families undergoing hardship are often taken in by relatives—Hawley, whose children are grown, is currently raising three of her grandsons, who are under the age of ten—and the subsistence way of life is tied to a hyper-local understanding of the land and its intricacies. But the number of people involved is small, and the price tag so high that some in Alaska have questioned whether keeping such communities intact is worth the cost.

"We are actually starting to think more proactively when it comes to how we make our coastal communities more resilient in the face of climate change," Lisa Murkowski, the senior senator from Alaska, was quoted as saying in the Nome *Nugget* after a visit to Western Alaska following Merbok. "But for communities like Shishmaref, Shaktoolik, or Golovin that are sitting on ground as flat as this table with no protection around them—is that the safest

place for those people?" she continued. "Even though their families have been there for generations?"

Newtok, the village that has progressed furthest toward relocation, has become as much a warning as a case study. Its population is split between two villages that are nine miles apart, neither of which is fully functional. To avoid some of the same pitfalls, other villages have pursued strategies of "managed retreat" or "protection in place." Managed retreat focusses on moving structures away from hazardous areas; protection in place focusses on reinforcement in order to buy time. In Kivalina, several people I spoke with preferred not to use the word "relocation." They call it, instead, an "expansion."

One evening, I walked across the road from the BnG to the village's community center, to visit a sewing class, one of the *IRA*'s social programs designed to teach young people traditional practices, including needlework, fishing, and hunting. Since July, a woman in her sixties named Bertha Adams had been instructing seven teen-age girls in how to sew fur-trimmed parkas. The parkas are made from padded nylon fabric, with ribbon-and-bias-tape embellishments in patterns designed by Adams. Everyone in the class had finished her coat except a high-school student, who sat silently stitching fox fur onto her parka, a thimble on one finger. The large room was cozy and smelled faintly of Lysol. Adams wore a T-shirt with a husky sporting a mining hat from the Red Dog Mine, where she used to work. On the radio, which was playing through a CD-cassette boom box, an announcer read the temperatures and wind speeds of various villages over a gentle hiss of static.

After the student finished sewing, she and Adams brushed bits of thread from the coat using a coffee filter. "Drumroll!" Adams said, beaming, as the student tried it on. Adams told me that she had another reason to celebrate: her nephew had just killed his first moose. In Inupiat tradition, a young hunter's first kill is given to elders and people in need, and the nephew had given the moose to Adams to help distribute it. She had passed on the best parts to his grandmother but kept the ribs, to make into a soup.

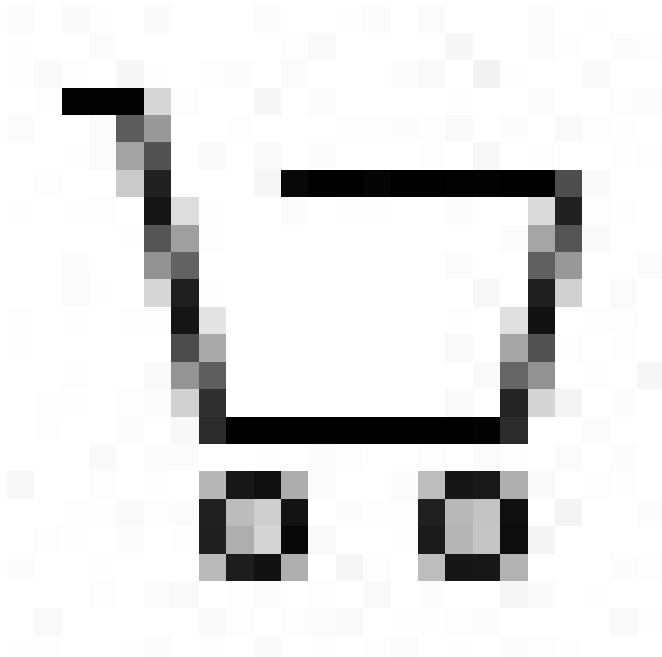


“We used to hibernate, but then we got the matching scarves.”
Cartoon by Victoria Roberts

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Kivalina has few social spaces. There's a Friends Church in addition to the Episcopal Church; they both hold services on Sunday. The Kivalina Native Store, which is owned by the tribe, and three small, family-run stores are the only places to shop. Other opportunities for public gathering happen at the school gym, which is open to adults for basketball at night, or at bingo, which happens every night of the week except Sunday and Wednesday.

The bingo hall sits across from the village's water tanks. It is a large room with scuffed linoleum floor. On the evening that I went to play, the man calling the numbers, in the front of the room, was a member of the volunteer search-and-rescue squad named Carl Swan, a cousin of Janet Mitchell's. The bingo was relaxing: the soft whirr of the balls in the air machine, the mild concentration of applying the ink dabber to the newsprint bingo card, the smell of cigarettes that wafted in from the entryway between games. Alcohol is banned in Kivalina, although it finds its way in. (When I asked one resident if alcohol was "a problem," he laughed. "Yeah, it's a big problem," he said. "It costs too much.") A water-stained notice on the wall displayed the liquor ordinance, and the bingo players drank sodas and energy drinks. People in Kivalina are suspicious of their drinking water because of the mine.

The Red Dog Mine is some fifty miles to the east of Kivalina. Every spring, when the ice begins to melt, the mine discharges its wastewater into Red Dog Creek, which flows into the Wulik River, from which, downstream, Kivalina draws its drinking water. Many of the houses I visited had Brita or Berkey water filters on the kitchen counters. (A spokesperson from the mine said that the wastewater is treated and discharged under strict water permits that comply with the Clean Water Act.)

Kivalina has a complicated relationship with Red Dog. In lieu of taxes, the mine makes annual payments to the Northwest Arctic Borough, which provides most of the municipality's operating budget. Teck Resources, the Canadian company that owns the mine, also pays *NANA* a share of its revenue. Every Native corporation in Alaska gets a cut of the revenue, but Kivalina bears a disproportionate environmental impact. I heard residents blame the mine's haul road for interrupting the migration of the Western Arctic caribou herd, and its ships for altering the paths of belugas and bowheads. (The mine spokesperson said that leaders from Kivalina are on a subsistence committee that meets regularly with mine representatives to develop procedures and policies designed to minimize potential wildlife impacts.) Relocating a few miles inland will not alleviate these concerns, however, as Kivalina's drinking water and hunting grounds will remain the same.

The mine's assurances that the drinking water is clean have not eased fears that something is affecting the villagers' health. Hawley teared up as she described babies in the village who had been born with severe congenital anomalies. "I don't like to talk about this, because it just gets to me," she said. "The only thing we had when we were growing up was snotty noses and sore throats."

In 2004, a group of six villagers filed a lawsuit against Red Dog for violations of the Clean Water Act. A federal judge found that the mine had violated the act more than six hundred times. In a settlement, the company agreed to build a discharge pipeline directly from the mine to the sea, but it later paid an eight-million-dollar civil penalty to the U.S. instead, citing feasibility issues. In 2017, the village, *NANA*, and Teck signed a memorandum of agreement to jointly address environmental concerns. The village has also pushed for more local hires, and it is only recently, Hawley

told me, that enough people in Kivalina have found steady work at the mine to more than fill a nine-person prop plane.

One afternoon during my stay in Kivalina, representatives from the mine participated in the first in-person community-relations meeting to be held with the village since 2019. In the school gym, under the banners of the Northwest Arctic Borough athletic league (Kivalina's mascot is the *qavvik*, or wolverine), the villagers, who ranged from toddlers to the very old, sat on bleachers. A wide array of habitats were depicted in their camouflage outerwear: winter birches, spruce forests, marshy rushes. Representatives from Teck and *NANA*, wearing business-casual clothes, set up tables with various mining-related brochures and greeted the Kivalina residents with an upbeat air.

The villagers had plenty of questions. One wanted to know why the loader that handles the mine's ore wasn't covered, to contain hazardous dust. Another asked about a moose that had recently been hit by a mining truck—weren't the trucks supposed to stop? A former employee at the mine questioned whether budget cuts were the real reason that he'd been let go a couple of weeks before his probation period was supposed to end. Few of these questions received direct answers, although they were logged into a laptop by a woman sitting at a folding table. (The mine spokesperson has since explained that the loader does have dust covers, and that the truck driver was unable to brake in time.)

Red Dog's days are numbered. In nine years, the source of more than eighty per cent of the Northwest Arctic Borough's operating budget will tap out. While exploration is under way at several sites nearby, they are not all on *NANA*-owned lands. A slide-show presentation, given by a Teck representative named Rachel Wallis, focussed on Teck's past approach to mine closures and reclamation, the process by which the environmental effects of a closed mine are minimized. Wallis, who is from Canada, had blondish hair and wore a red plaid dress and knee-high boots.

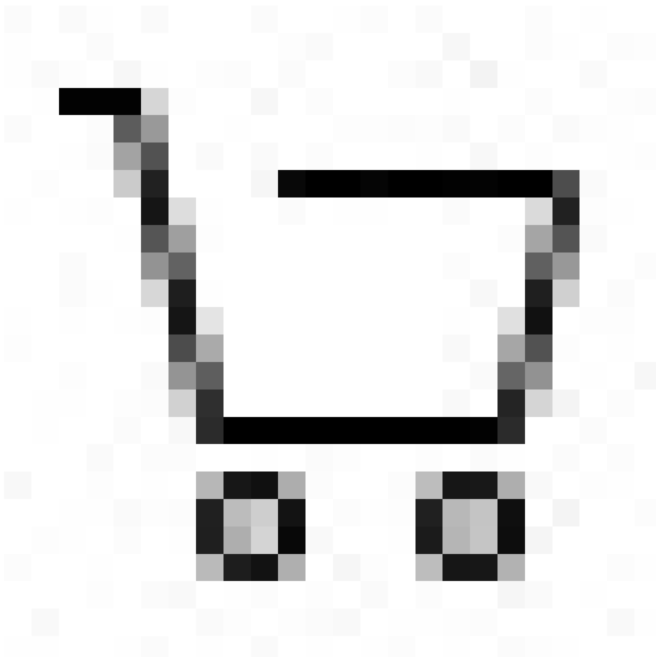


Cartoon by Roz Chast

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“Does anyone know how much Red Dog has put aside for reclamation at this point?” Wallis asked. Nobody responded.

“Six hundred million,” she said. “I think it should help give some comfort that these things have been planned ahead so that it isn’t a burden to the taxpayer, to the community, to the environment, and to the animals.” The money that had been set aside was less than the mine’s revenue for 2021.

The mine officials explained part of the plan in shorthand: the waste rock would be covered with a layer of impermeable plastic, and then a layer of soil, which would be planted with what one mine representative described as “native seed.” This process is meant to prevent what is known as acid-rock drainage, which happens when waste rock—what the mine removes in order to reach the ore—is exposed to oxygen and water and releases sulfuric acid into the environment. The acid can change the pH balance of a watershed, causing die-offs of aquatic life and leaching heavy metals from rocks which, in turn, can accumulate in plants and make their way up the food chain. One way to prevent this is to keep the waste rock permanently protected from the elements.

“Reclamation plans are a big part of the community,” Wallis said at one point. “Some people even want certain kinds of medicines planted there,

certain kinds of berries, people might want to open up a campsite—there's a whole range of things that you can do when you close a mine."

She showed a before-and-after photograph of the reclamation of a lead, silver, and zinc mine in British Columbia. The first image, taken at the turn of the twentieth century, showed an industrial site. The second picture had the vivid green grass of a Microsoft Windows screen saver.

"What kind of fertilizer do you use to make it so green?" Alice Adams, an elder who serves on the Kivalina City Council, asked.

"Have you ever been to British Columbia?" Wallis asked. "It is very, very green in British Columbia. It's like an emerald jewel."

The meeting went on, and the questions became more contentious. Discussion turned to allegations by the villagers that the mine was discharging its wastewater too early in spring, before the ice on the river had fully melted, and that the increased flow of water was breaking up the ice and curtailing their ice-fishing season. A slide show had paused on a photograph of a large herd of caribou roaming the hills near the mine. Someone asked when it was taken; she couldn't recall the last time she had seen a herd that big in the area. (The mine spokesperson said that before the mine discharges its wastewater Kivalina residents are taken up in a helicopter to see the state of the ice.)

Another elder raised his hand and was given the microphone. "I've been here from the beginning of the mine," he said. "They told me, 'We leave the land like it is when we first come in. If we leave in 2036, that's the last day, we leave it like we come in.' Broken promise! Broken, broken promise!"

The meeting concluded with a hurried raffle. The company gave away an Amazon tablet, a Bose speaker, and vouchers for stove oil and gasoline. Alice Adams won a coffee gift bag. "I don't drink coffee," she said, as she collected it. Then the mine representatives packed up their projector and their collapsible screen and their brochures and caught their plane out of town.

Janet Mitchell, the storm chronicler, had good news later that night: her grandson's hunting party had travelled up the Wulik River by boat and killed a caribou, a straggler isolated from its herd. The next morning, her nephew Clinton sat outside the community center with the carcass, teaching her grandson Aaron and another teen-age boy how to skin it as older relatives had once taught him. "The liver makes a great breakfast with pancakes," Clinton told me. Mitchell rolled up on her Honda four-wheeler and snapped some photographs. The caribou's hind legs were unceremoniously placed in a cardboard box on the ground, hooves up. As the boys used their fists to separate the animal's skin from the carcass, other villagers stopped by on their Hondas to get intel: *You guys just see that one*? *There's gotta be more coming.*

"Up in the hills, maybe," Clinton said, referring to an area farther east of the new village site, where the tundra and the floodplains give way to the foothills of the De Long Mountains.

Later that afternoon, I was having coffee with Carl Swan, the bingo caller, when Aaron came to the door holding the caribou's heart and some ribs, a gift from his first hunting trip. Swan broke apart a Dr Pepper box and laid the meat on it before returning to our conversation, and the teen-ager went back outside. Swan told me that two of his own children were studying at a public boarding school in Kotzebue, where he hoped they would get a better education than they could in Kivalina.

"Kivalina is a very hard place to live in, not just because of the massive snowstorms and blizzards and rain and those kinds of things but everything from our history," Colleen Swan had said to me. "Poor living conditions are a contributing factor to juvenile delinquency. The doctrine of discovery is a major contributor to the social problems in a lot of Native communities," she continued, using a term that refers broadly to the justifications of colonization. "Because of the climate issue, many of our young people won't experience life as I have lived it." In recent years, Swan has immersed herself in a writing project about what she calls "the ancient ways."

"My dad would hunt with dog teams. They had skin boats to hunt in the water. The kids are not going to experience this ever, because even the

bearded seals are suffering. Everything that swims in the ocean is feeling the impact."

In Kivalina, there was little illusion of a separation between damage to the environment and damage to humans. Relocation might ease overcrowding, and the arrival of running water in rural Alaskan homes has been correlated with reductions in respiratory, skin, and gastrointestinal infections, but Kivalina has other problems, too. Rates of obesity and diabetes have risen, and they might worsen as environmental changes continue to affect subsistence hunting and fishing practices. Some impacts of climate change, such as the long-term outlook for the area's permafrost, are still unknown. One villager expressed worry about a crack that had already appeared in the new road.

Still, Millie Hawley told me that the road and the promise of relocation had improved morale. "People started relaxing when that road was built, because now they have an escape plan," she said. "Before that, you could feel the doom and gloom in the village for many years. It was, like, hopeless. People were wild, they did anything. They would say things like 'We're gonna die anyway.' "

One afternoon, Janet Mitchell asked if I wanted to see the new school site with her youngest brother, Replogle (Reppi) Swan, Sr., who is a whaling captain, the fire chief, and the president of Kivalina's search-and-rescue team. Because of his civic duties, Swan has a white pickup truck. It was one of a total of four cars I saw in Kivalina, something that might change now that the village has a road, even if it's only eight miles long and ends, for now, at a construction site. When we stopped by his house, Swan turned off the reality TV show "Alaskan Bush People," and we got into the truck. Also along for the ride was his wife, Dolly. The Swans are avid hunters, and the trip doubled as a chance for them to scout for caribou. As we drove, Willie Nelson's "Seven Spanish Angels" played on the radio, and Dolly scanned the horizon with her binoculars.

"Those mountains in the back are white," Dolly said, looking at the De Long range in the distance.

"I'm not ready for winter," Mitchell said.

Swan drove slowly, protecting his tires from the road's sharp gravel rocks. The landscape was golden and strewn with ponds and occasional tracks where Hondas had passed through. The name of the hill that the new village site abuts is Kisimigiuqtuq, but many people refer to it as K-Hill. It was not a place with a known history of permanent habitation—the ancestral Kivalliñigmiut had kept their dwellings near the coasts or the rivers, for purposes of transportation and access to water. At the end of the road was the new school, a large building with gray metal siding and accents of lime green and teal, built on piles in order to keep piping above ground and prevent the permafrost underneath from melting. There was a small, bright-colored playground in front of the school, and two yellow school buses, brought from Anchorage by barge, were parked nearby. One of Millie Hawley's many headaches was finding someone who was willing to get a commercial driver's license to operate them. The weather at K-Hill is harsher than it is by the coast, and, because of the prevailing winds, snowdrifts can reach thirty or forty feet high. The school was planning to build a snow fence. The buses looked as though they'd been designed for another universe, one of paved roads, gas stations, and crossing guards. Next to the school was a construction camp housing some of the workers I'd seen on my flight from Anchorage. They mostly kept to themselves, their food brought in from elsewhere. Starting in November, when the school opened, everything would need to be transported here, eight miles from the airport: the students, the food for their lunches, heating oil to keep the building warm, water.

Reppi Swan did a wide loop around the school and continued up the hill, revving past the point where the road petered out to reach a crest, four hundred feet above sea level. We got out of the truck and stood looking out at the tundra, which unfolded before us, brown and untroubled, far into the mountains. It was freezing, and winter had not even started. Mitchell and Swan exchanged stories of the Little People, a parallel tribe who, Mitchell told me, lived among the Inupiat people before deciding that they preferred to live in isolation. Some say that Little People still visit Kivalina. On his phone, Swan showed me a zoomed-in photograph that featured several white dots outside a cave. In the next photo, the dots had disappeared, and Swan suggested that they might have been Little People. Swan and Dolly spotted a couple of musk oxen in the distance, but nothing they cared to pursue. We stayed there for a while, in the whipping wind, then returned to the warmth

of the truck and drove back to Kivalina, which in this empty, open place seemed to be all there was of the known world. ♦

By Antonia Hitchens

By Geraldo Cadava

By Benjamin Wallace-Wells

By Jill Lepore

Annals of a Warming Planet

- Climate Change from A to Z

By Keith Gessen

By Margaret Talbot

By Bill McKibben

By Susan B. Glasser

Books

- **What Going Off the Grid Really Looks Like**
- **How the Huxleys Electrified Evolution**
- **Briefly Noted**

By Kathryn Schulz

“In the United States,” Gertrude Stein once observed, “there is more space where nobody is than where anybody is.” That was true in 1936, when she wrote “The Geographical History of America,” and it remains so today. The numbers are startling, and not only if you live someplace like the Upper East Side of Manhattan, with your hundred thousand neighbors per square mile. Add up all the developed areas in the fifty states—the cities and suburbs and exurbs and towns, the highways and railways and back roads, the orchards and vineyards and family farms, the concentrated animal feedlots, the cornfields and wheat fields and soybeans and sorghum—and it will amount to a fifth of our nation. What is all the rest? Forests, wetlands, rangeland, tundra, glaciers, barrens, bodies of water of one kind or another. If you don a blindfold, throw a dart at a map of the country, and commit to living where it lands, you will most likely end up alone, in the middle of nowhere.

All that open space has an enduring hold on the American imagination. There’s a reason it serves as the backdrop for so many political ads and pickup-truck commercials: it represents the ill-defined notion of liberty that we claim as our founding ideal, and functions as a kind of collective backup plan should some crucial opportunity or exigency arise—a place to prove our mettle, a place to start over, a place to which, if push came to shove, we might flee and never be found. Most of us do not put this proposition to the test. But, by choice or chance or lack of any other option, a handful of people really do wind up trying to make a life somewhere in the almost eighty per cent of America that is essentially undeveloped land.

Some of those people are the subject of Ted Conover’s “Cheap Land Colorado: Off-Gridders at America’s Edge” (Knopf). Conover, who was raised in Denver and is now a professor of journalism at New York University, might be thought of as a reporter in the George Plimpton mold; to write about his subjects, he prefers to spar in their rings and scrimmage on their fields. Unlike Plimpton, however, he sticks around for months or years, often under distinctly uncomfortable circumstances. For a book about modern-day hoboes (“Rolling Nowhere”), he learned to hop freight trains and spent months riding the rails; for a book about undocumented immigrants (“Coyotes”), he lived with Mexicans on both sides of the border, picking fruit in citrus orchards and travelling across the Sonoran Desert and

the Rio Grande; for a book about the New York State prison system ("Newjack"), he got a job as a corrections officer and worked for a year inside Sing Sing.

The Best Books of 2022

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Then came November 8, 2016. The day before the election, Conover had declared on a radio program that Donald Trump would never win the Presidency; afterward, like countless other members of the media, he was stunned into the conviction that he no longer understood his compatriots and needed to embark on a grand reëducation. In keeping with a long tradition of believing that the immensity and wildness of our nation hold the key to its essential character, he found himself thinking about the least populated parts of his home state. "The American firmament was shifting in ways I needed to understand," he writes in the new book. And so, eager to learn more about his fellow-citizens, Conover headed west, to a place where almost none of them live.

The cheap land of "Cheap Land Colorado" is in the south-central part of the state, in a region known as the San Luis Valley. The largest alpine valley in the world, it has an average elevation of more than seven and a half

thousand feet, a couple of thousand feet higher than the Mile High City. Although it is comparable in size to New Jersey, which has a population of 9.3 million, the valley is home to fewer than fifty thousand people, around ten thousand of whom live in a single town, Alamosa. Most of the remaining residents live in other, smaller towns, but some of them—maybe around a thousand people, although no one seems to know for sure—live scattered across an enormous area of the valley known as "the flats." Nearly all the people Conover meets on the flats are poor, yet they generally own their own land. In fact, most of them were drawn to the area because it is possible to buy a piece of America there for rock-bottom prices—typically, somewhere between five hundred and a thousand dollars per acre, or roughly half what you're likely to pay for a single square foot in Manhattan.

There is a hitch, of course. The flats possess almost no infrastructure: no electricity, no water, no sewer system, no pavement, precious little Internet or cell service, and a long drive on dirt roads unknown to most mapmakers for jobs or schools or medical care or a gallon of milk. Most of the people Conover meets live in trailers, sometimes augmented with sheds and shacks; they buy tanks of propane and two-hundred-and-seventy-five-gallon drums of water, rely on generators or solar panels for electricity, burn their trash in barrels, and use outhouses for human waste. A significant number of them, taking advantage of Colorado's lax drug laws (if also frequently bending them), grow marijuana.

All this is somewhat surprising, because the San Luis Valley has many of the hallmarks of a lovely—and pricey—place to live. It has a dry climate, enjoys nearly two hundred and fifty days of sunshine a year, and boasts spectacular views: to the east, Great Sand Dunes National Park, and, towering behind it, the Sangre de Cristos; to the west, the snowcapped peaks of the San Juan Mountains. The weather is cold, but not atypical for the Rocky Mountain West, and the water resources are plentiful by desert standards. Nothing, in other words, makes the valley intrinsically less appealing than, say, the desert land around Joshua Tree, in California, where five acres might run you a quarter of a million dollars.

Conover keeps his readers waiting for too long, almost half the book, before saying anything about how the San Luis Valley came to be a magnet for the dispossessed. That story—about greed, grift, credulity, and the great

American yearning to own things—begins after the Second World War, when developers started acquiring undeveloped land, rebranding it as residential, and subdividing it into lots for single-family homes. The honest ones made the land livable before selling it off, putting in everything from roads and utilities to houses, swimming pools, and golf courses. The dishonest ones did not, which is how people around the country, dreaming of retiring in sunny Florida, wound up buying a piece of uninhabitable swampland.

This subdivision craze reached southern Colorado in the nineteen-seventies, when developers began buying up enormous swaths of the valley and giving them names like Rio Grande Ranches. One pair of savvy businessmen staked out property lines for an estimated forty thousand five-acre lots, graded the roads meant to connect them, and then did absolutely nothing else, except profligately promote their product. They placed ads in *TV Guide* and in newspapers nationwide, promising "spectacular sports and outdoor adventure," "game galore," and "Healthful Sunbright Skies"; they bought up lists of people who had purchased rifles or Western novels or subscriptions to hunting magazines, then sent them mailers hawking five acres for under two grand in cash, or thirty dollars a month at six-per-cent interest. These tactics worked: a stunning number of people bought land in the flats sight unseen. One salesman recalled, "That guy in Illinois would tell his neighbors, 'Yep, I just bought a ranch in Colorado. I'm gonna run out there this summer and check it out.' "

Those neighbors might have been impressed, but the Federal Trade Commission was not. The advertisements suggested that land in the San Luis Valley was a good investment, which, given the absence of amenities, was plainly untrue: unhappy buyers could not sell their parcels for what they had paid, if they could sell them at all. In 1979, under pressure from the federal government, the developers agreed to cancel all outstanding debts and refunded as much as fourteen million dollars. But they never made any further improvements, with the result that, a half century after those original lots were surveyed, land in the San Luis Valley, unlike the vast majority of real estate in America, has appreciated almost not at all.

"Cheap Land Colorado" opens with a problem. Conover wants to meet the off-gridders of the San Luis Valley, but many of them live there precisely

because they do not want to be met—a preference they sometimes broadcast, he writes, "by closing their driveway with a gate, or by chaining a dog next to their front door, or by posting a sign with a rifle-scope motif that says, 'If you can read this you're within range!' " As a way around this prevailing suspicion of strangers, he starts volunteering for an outreach program run by a social-service organization called La Puente, based in Alamosa and widely respected around the valley. In this capacity, he drives around the flats in a pickup truck with the group's insignia on its side, visiting properties, introducing himself to their owners, and, as a more or less literal icebreaker, offering them free firewood. (In the valley, as in an Annie Proulx story, freezing to death is an ever-present possibility.)

This strategy pays off, in that Conover's book is full of remarkable characters. These include Frank and Stacy, who live in threadbare but cheerful chaos in a mobile home with their five homeschooled daughters, a cockatoo, various dogs, and, outside, goats, a pig, ducks, and, soon enough, Conover himself, who pays them a hundred and fifty dollars a month to park his newly acquired trailer on their land. There is also Paul, a gay guy who has lived in the flats for more than a quarter of a century—long enough to raise up from sapling-hood a little grove of Chinese elms, the envy of other residents in a part of the valley almost entirely devoid of trees. There is Zahra, who moved from the Chicago area to help start an African-nationalist group, got fed up with the would-be leader's dishonesty and his half-finished home, squatted elsewhere in the flats for six months, and then fell in love with a white rancher who grew up in the valley. There is Luke, who identifies as having Asperger's syndrome, excels at fixing anything electronic, pans for gold in the nearby mountains, and dreams of making money by selling goat milk, heirloom tomatoes, and homemade cheese. There is Nick, a representative example of a local species known as a prairie rat: "a person who could probably get a minimum-wage job somewhere if he wanted to but preferred just to hang out, subsist, keep a low profile, and do the drugs that made him happy." There is a nameless gender-nonconforming couple who are widely disliked, partly for their self-presentation but also because they are rumored to be cooking meth in their trailer and are caught pumping water from the Rio Grande, which is illegal and, in the valley, almost the greater infraction. There are people it is impossible not to despise, like Zane, a tattoo artist from Alabama who, together with a friend, flaunts his disregard for government and law enforcement until they are both

arrested on charges of sexually abusing their daughters; people it is impossible not to pity, like Geneva, whose husband and son die within six months of each other, the latter after coming too close to an electrical line; and people it is impossible not to admire, like Teotenantzin Ruybal, stern, steady, and compassionate, who runs a homeless shelter that serves residents of the flats when a crisis strains their already meagre resources or a trailer proves no match for the high-desert winter.



Cartoon by P. C. Vey

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Ruybal grew up in the San Luis Valley, but most of the other people in "Cheap Land Colorado" arrived there later in life, generally propelled by the kinds of forces—grief, destitution, divorce, addiction, inability to fit in, outstanding warrants—that produce either profound inertia or a tendency to

drift. One such person is Matt Little, a La Puente employee who, in addition to the many other ways he helps Conover—training him for his volunteer work, hitching up the trailer he buys and driving it out to the flats—provides the title for his book. An Iraq War veteran and a native of a moribund West Virginia steel-mill town, Little married a home-town girl, had two sons, then won the state lottery and bought a house for his family. One of his sons turned out to have paranoid schizophrenia; the house, which was not insured, burned down. Three months later, his wife died, of chronic obstructive pulmonary disease. Little, desperate to get away and dreaming about images he'd seen in old *Field & Stream* magazines, went online and Googled "cheap land colorado."

All of these people are fascinating, but none of them is the main character of the book. That role goes to Conover, who calls the second chapter "My Prairie Life, Part I" and the third "My Prairie Life, Part II." The titles change after that, but the gist remains the same. As a writer, Conover is most at home in the first-person present tense; he prefers the closeup to the wide-angle shot, action to exposition, the immediate moment to context or history.

The virtue of this approach is that it brings the San Luis Valley into relief. Conover has a good eye for the particularity of life on the flats: a kid out riding her bike crashes into an antelope; a family dresses its pet Chihuahua in a leopard-skin sweater to keep it from getting eaten by hawks; a man uses crushed beer cans to landscape the area outside his trailer, as a suburbanite might use mulch. All along, the scale and the solitude of the valley quietly assert themselves. By day, on the long dirt roads, locals roar into intersections at top speeds, knowing that if a vehicle were heading toward them its dust plume would be visible from afar; by night, the sky above those same roads is dense with stars, while rabbits and nighthawks appear like fleeting motion-picture shows in the headlights.

Still, all this immediacy comes at a cost, one I felt acutely throughout the book: off to the side of Conover's own high beams, a great deal lies in darkness. The tens of thousands of other people living off the grid elsewhere in America are acknowledged in a single parenthetical aside, and the scope of rural poverty in this country goes entirely unmentioned. You would not know from "Cheap Land Colorado" that life in the San Luis Valley, presented here as extraordinary, looks a lot like life in countless other

impoverished places. Nor does Conover pay much attention to the structural problems that have swept his characters out onto the flats, like so many Joads on the road. Although he wrote an entire book, "Whiteout," about Aspen, which is a few hours away and has a median home price upward of three million dollars, we get no consideration of that town here, no sense that the lives of the rich have any bearing on those of the poor.

The cumulative effect of all this is that "Cheap Land Colorado" reads less like "Evicted" or "The Warmth of Other Suns"—two other books about the quest to find a home in America—and more like a travelogue. The San Luis Valley we encounter in the book exists mostly insofar as Conover is there exploring it; only occasionally do we see the place or its people without the writer in the frame. Sometimes this author-centric perspective serves the story well. After his first night alone in his trailer, Conover wakes up in the morning to discover that everything inside it is iced over—including his toothbrush, left damp the night before, and, more pressingly, his door, which has frozen shut, trapping him inside. It is a classic fools-rush-in moment, light with a sharp-edged shadow, and it tells us all we need to know about the chronic proximity, in such a place, of disaster.

But on the whole "Cheap Land Colorado," although consistently interesting to read, is hamstrung by the hovering presence of its author—not because Conover isn't good company on the page but because his book never finds another focus. It is full of so many compelling people that he could have assembled a truly stellar ensemble cast—or, conversely, picked a few of them and stuck with them long enough to make their own prairie lives vivid, expansive, and illuminating. Instead, most of the characters wander in and out of the book without leaving much behind, except for the impression that potentially captivating stories have gone untold. After meeting a mother and daughter, Rhonda and Kea, who came to the San Luis Valley by way of Chicago and California, Conover writes, "They were among the few Black people I had seen out there, and I was curious about what forces had attracted them to this place—or pushed them from somewhere else." If he ever sated that curiosity, he doesn't tell us; they show up just once more in the book, and are gone again in the space of two paragraphs.

What makes this distractible style of storytelling particularly frustrating is that it is at odds with what Conover claims to do. This is something he calls

“immersion journalism,” a method he teaches at N.Y.U. and writes about in another book of his, “Immersion: A Writer’s Guide to Going Deep.” As he explains in those pages, immersion journalism is “work that grows out of a writer’s efforts to learn about somebody else’s world by placing himself in it for a while.” Thus defined, it is basically indistinguishable from participatory journalism, as it was called in Plimpton’s day, and from New Journalism, whose practitioners—Tom Wolfe, Hunter S. Thompson, and so on—threw themselves into other worlds with gusto. For that matter, it is also difficult to distinguish from a lot of plain-old-journalism journalism, at least of the book and magazine varieties.

Why, then, the new term? Blame journalism schools, which, like nineteen-seventies real-estate developers, are in the business of creating subdivisions and selling them to the public. Immersion journalism, long-form journalism, literary journalism, investigative journalism, narrative nonfiction: all this was once the open rangeland known simply as “reporting.” No matter what other name you gin up for the work, it has always been the case that the best way to tell a story is to get as close to it as possible and learn as much about it as you can. Whether the result is short or long, shallow or deep, bare-bones or brimming with scenes has nothing to do with how you characterize the process of writing it, and everything to do with familiar constraints: the outlet, the editor, the budget, the nature of the story, the proclivities and abilities of the author.

Still, calling a work of nonfiction “immersion journalism” does matter in one respect: it shifts the emphasis away from the story and toward what the writer is doing to tell it. Conover has no difficulty convincing us that the flats are a fascinating place, but when he muses on how they “felt like a perfect complement to my life in New York City” he makes his own time there seem like rural cosplay. Nor is it useful to learn that, since 2017, he has availed himself of the flexibility of his academic career to make “more than twenty trips to the valley.” Details like that are meant to convey his commitment and bolster his credibility, but journalism is not junior high school. You don’t need to prove that you did your homework; you just need to know your stuff.

In this case, Conover tells us, what he wants to know is why Trump won the 2016 election. Yet “Cheap Land Colorado” contains no consideration of that

state's electoral politics, although they are noteworthy: in the last two Presidential elections, an increasingly blue Colorado gave its electoral votes to Hillary Clinton and Joe Biden, while the six counties that make up the San Luis Valley were more divided, with three of them voting for Trump both times, two of them voting Democratic both times (by up to eighty-one per cent of the vote in some of the towns), and one of them flip-flopping. Nor does Conover reflect on the challenges of voting in a place like the flats. Colorado has been a vote-by-mail state since 2013, but rural delivery doesn't exist out on the flats, and it's unclear how many people, in a community disproportionately characterized by poverty, transience, and distrust of government, would travel to a designated polling station to cast their ballots in person.

All of this raises a question: Did the Trump voters Conover went west to meet actually vote for Trump? He never asks, and we never learn. When, in the course of the book, we do cross paths with *MAGA* types, they are already familiar to us—from our own communities, and from years of diner journalism. We witness an exchange between a conservative couple and a liberal volunteer who has come as part of a church group to help fix up their property; we sit in on a visit with some particularly out-there conspiracy theorists (the C.I.A. is run by the Vatican, John McCain donated a billion dollars to Al Qaeda, etc.); we watch as the coronavirus and Black Lives Matter protests reach the San Luis Valley, both with tragic results; we learn that Matt Little and Luke—the one who dreams of selling goat milk and heirloom tomatoes—have grown convinced that the 2020 election was stolen.

Conover presents all this almost without comment. Although he doesn't hide his own views, he also makes no real effort to account for those of his subjects, and, despite his stated goal, I began to suspect that he didn't really care all that much about how, or if, his new neighbors had voted. This change of heart, if that is indeed what happened, renders the frame of "Cheap Land Colorado" somewhat wobbly. Yet it also comes as something of a relief, after years of tedious Trump-era journalism in which certain lives suddenly commanded attention for purely instrumental reasons and those farthest removed from power were expected to illuminate its inner workings. It is, after all, extraordinarily difficult to explain this immense country and its millions of citizens. We are frustrated by anecdotes because they seem

arbitrary and unrepresentative, frustrated by statistics because something urgent and human always escapes them, frustrated by the past because it is not reliably predictive, frustrated by the future because it remains stubbornly unknowable.

But, although our national character might be elusive, we are, as "Cheap Land Colorado" regularly reminds us, a nation full of characters. Conover's book is bursting with dreamers and druggies, drifters and grifters, the deluded, the dangerous, the salt of the earth. It is difficult not to experience some fellow-feeling for almost all of them, and for the place itself, which offers up to even the poorest of the poor its astonishing grandeur. And so it is strange but not altogether surprising when, in the end, Conover simply succumbs to the allure he set out to explain and decides to buy land in the flats: five acres, plus a trailer, in the middle of a nowhere that, for him, is now the center of something. ♦

By Janet Malcolm

By Robert A. Caro

By Patrick Radden Keefe

By Philip Gourevitch

How the Huxleys Electrified Evolution

Defending Darwinism from both clerical and scientific opponents, T. H. Huxley and his grandson Julian shaped how we think about the past and future of our species.

By Manvir Singh



Thomas Henry Huxley almost skipped the showdown of his life. It was the fourth day of the 1860 meeting of the British Association for the Advancement of Science. He was tired. He had spent the earlier part of the conference mingling, attending talks, and defending his friend Charles Darwin's new book, "On the Origin of Species." He was keen to escape the Oxford bustle and relax with his wife at her sister's home, near Reading.

He knew that the fourth day would be charged. Everyone did. The Bishop of Oxford, Samuel Wilberforce, was scheduled to appear. The son of the abolitionist William Wilberforce, the Bishop was considered one of the greatest orators of his time—part viper, part soapbox parliamentarian. He had been armed with anti-evolution arguments by one of Darwin's rivals, the anatomist Richard Owen, and arrived in Oxford ready to deploy.

“I trust you will not allow yourself to be in any way disgusted or annoyed by the considerable abuse and misrepresentation which, unless I am greatly mistaken, is in store for you,” Huxley had written Darwin just before the publication of “The Origin.” “I am sharpening up my claws and beak in readiness.” And indeed, in the seven months since the book’s publication, Huxley had showed up slashing and pecking. He wrote reviews and rebuttals for the London *Times*, *Macmillan’s Magazine*, and *The Westminster Review*. In a public lecture for the Royal Institution, he not only defended “The Origin” but also explored its most sacrilegious implication: our kinship with apes.

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Still, he expected a confrontation with the Bishop to be trickier. Huxley later recalled that Wilberforce “had the reputation of being a first-class controversialist.” He could hardly “see the good of giving up some peace and quietness to be episcopally pounded.” But peer pressure got to him. He explained that a fellow-evolutionist had accused him of deserting the Darwinians: “So, I said, ‘Oh! if you are going to take it that way, I’ll come and have my share of what is going on.’ ”

The resulting face-off is now legendary. It was included in Hal Hellman's book "Great Feuds in Science: Ten of the Liveliest Disputes Ever" (1998). It was reënacted in the PBS documentary series "Evolution" (2001) and the BBC television show "The Voyage of Charles Darwin" (1978). It inspired Crispin Whittell's play "Darwin in Malibu" (2003), which imagined Darwin, Huxley, and Wilberforce meeting in a beach house in the afterlife more than a century after their deaths. And, like one of those enormous mama spiders carrying an ungodly number of spiderlings, it continues to spawn a relentless stream of scholarly papers, including an article published last year titled "Enough of Galileo and the Huxley-Wilberforce Debate."

Today, the showdown is remembered less for its scholarly arguments and more for one of the zestier Victorian comebacks on record. After railing against "The Origin," the Bishop addressed Huxley and, according to the London weekly *The Press*, "asked the Professor whether he would prefer a monkey for his grandfather or his grandmother." There are different versions of Huxley's response, although the one he reported a few months later is (no surprise) the most eloquent: "If then, said I, the question is put to me would I rather have a miserable ape for a grandfather or a man highly endowed by nature and possessed of great means and influence and yet who employs these faculties and that influence for the mere purpose of introducing ridicule into a grave scientific discussion—I unhesitatingly affirm my preference for the ape."

By this point, Huxley had eclipsed his upbringing. Born in 1825 and brought up in a lower-middle-class family, he received just two years of formal education before apprenticing to his rambunctious, opium-chewing brother-in-law, the doctor John Cooke. After pursuing more medical training, he was assigned to the Royal Navy's H.M.S. Rattlesnake as an assistant surgeon. The ship's voyage to Australia and New Guinea, which lasted four years, revealed Huxley's talents in natural history. He spent his spare time dissecting marine invertebrates and mailing manuscripts to England. While he stewed in self-doubt in the South Seas, his scientific work was attracting attention at home, appearing in *Philosophical Transactions of the Royal Society* and in *Proceedings of the Zoological Society*. When he arrived back in England, in 1850, Huxley learned that he had become a noted scientist. He was elected a fellow of the Royal Society in 1851, won its medal for

physiology in 1852, and by 1854 had secured a lectureship in natural history at the Government School of Mines (now part of Imperial College London).

Even with his rising profile, the showdown with Wilberforce was a turning point for Huxley. He was, he later recalled, "the most popular man in Oxford for full four & twenty hours." More important, he gained a new perspective on public speaking, becoming convinced that he "should carefully cultivate it, and try to leave off hating it." While Darwin, forever sickly, stayed at home in the following years, Huxley fought as evolution's champion. He used his growing influence to expand scientific education, and he grappled with ethics and religion. (He coined the term "agnostic" in 1869.) From relatively modest beginnings, Thomas Henry Huxley became one of the most prominent public intellectuals in the English-speaking world.

It was fitting for a man known as "Darwin's bulldog" that his descendants inherited many of his traits—not just his talents but also his affinity for certain sweeping questions: Who are we? What is our place in nature? How can we design morality and religion in a world informed by science? In "The Huxleys: An Intimate History of Evolution" (Chicago), the historian Alison Bashford moves across the Huxley generations, tracing how Thomas Henry and his gifted brood struggled to answer these questions, in the process shaping outlooks we hold today.

Bashford focusses her chronicle on the two most evolutionarily minded Huxleys: Thomas Henry and his grandson Julian. The eldest child of Huxley's son Leonard—himself a notable writer and magazine editor—Julian enjoyed not one but two illustrious bloodlines. His mother, Julia, came from the Arnold family, a clan famed for its writers and scholars. (Matthew Arnold was her uncle.) After Julia's untimely death, in 1908, her sister, the best-selling novelist Mrs. Humphry Ward, both mentored Julian in his literary ventures and became a second mother to him and his siblings, Aldous, Trevenen, and Margaret.

Julian's bond with his paternal grandfather was special. "I like that chap!" Huxley said when Julian was four. "I like the way he looks you straight in the face and disobeys you."

Like his grandfather, Julian was a nerd for nature. As that four-year-old, he asked, “Why do all live things have natures?” Some three years later, when Huxley remarked that parental care was absent in fish, Julian interjected, “What about the stickleback, Grand-pater?” Their connection is apparent in a letter Huxley wrote Julian close to his fifth birthday: “There are some people who see a great deal and some who see very little in the same things. When you grow up I dare say you will be one of the great-deal seers and see things more wonderful than water babies where other folks can see nothing.”

Thomas Henry died in 1895, days after Julian turned eight. But, as an adult, too, Julian took after his grandfather. Both men were moral, extroverted, sometimes tortured, and sometimes arrogant. They were also ambitious synthesizers, wildly successful storytellers, and agnostic materialists dazzled by the expansiveness of nature. They were so alike that Bashford says they can even be thought of as “one very long-lived man, 1825–1975.”

“The Huxleys” is an intimate history of evolution in several senses. First, it chronicles the understanding of evolution by two of the theory’s most zealous apostles. In the decades after “The Origin” was published, a Darwinian brand of evolutionary theory spread, fuelled in large part by Thomas Henry’s advocacy. By 1900, however, “the eclipse of Darwinism” (to use Julian’s phrase) was setting in. Evolution was widely accepted, yet natural selection seemed a tad too fantastical. Was the Earth truly old enough for a process as slow as selection to have fashioned the diversity of life? Could the eyes of mammals and squids—so complex, so similar—really have evolved through blind tinkering? Reinforcing such objections was the fact that Darwin got some important things wrong, most notably inheritance. He believed that the traits of progeny were blended averages of their parents’ traits, yet Gregor Mendel seemed to show that traits were passed down as discrete units. Biologists struggled to square new discoveries about inheritance with Darwin’s ideas. When Julian studied zoology at Oxford, from 1906 to 1909, the discipline was in the process of abandoning natural selection.

Julian wasn’t going to give up on Grandfather’s credo. But neither—as he bounced from Oxford to Rice University to Oxford again, eventually landing at King’s College London—was he eager to settle into a specialty. “For goodness sake do decide which branch of biology you are expert in,” the

marine biologist George Parker Bidder implored him in 1925. "A man now cannot be a universal expert. . . . You must not be led away by the notion of imitating your grandfather." Julian, defiant as always, ignored the advice. In 1927, he abandoned academia to write a sweeping summary of biology, "The Science of Life," with H. G. Wells and his son G. P. Wells. Widely popular—both David Attenborough and Walt Disney later gushed about it—the book buoyed Julian's passion for storytelling and synthesis.

His own crucial vindication of Darwinian theory appeared in the book "Evolution: The Modern Synthesis" (1942), which reanimated the program. "The death of Darwinism has been proclaimed not only from the pulpit, but from the biological laboratory," Julian wrote, but he meant to show that Darwinism was "very much alive." The book—notable for its breadth, its clarity, and its literary flair—articulated a new vision of evolutionary theory, reconciling natural selection with insights from a slew of subdisciplines, including genetics, paleontology, and cell biology. It was also a quintessentially Huxley project. In a review for *American Scientist*, the geologist Kirtley Mather called Julian's defense of Darwinism "amusingly reminiscent of bygone days when another Huxley championed the cause of evolution in a wholly different battle."

In the half century before his death, Julian wrote some forty other books. He also won an Academy Award, ran the London Zoo, helped found the World Wildlife Fund, served as *UNESCO*'s first director-general, popularized the term "transhumanism," and coined the words "clade" and "cline." Along the way, he and his wife, Juliette, raised two sons—a botanist, Anthony, and an anthropologist, Francis. Truly his grandfather's grandson, Julian rose from being a disciple of Darwin to serving as a mouthpiece for science itself.

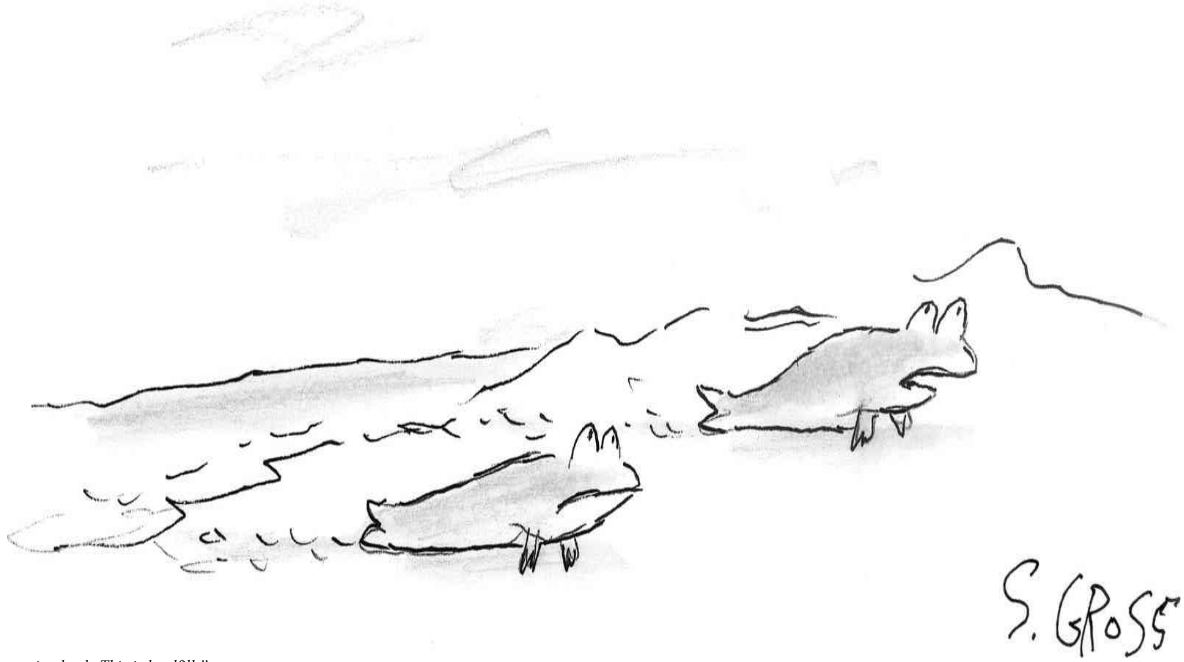
"The Huxleys" is more than an account of how two celebrity scholars fashioned and sold evolution. It is also about the implications that the men discerned in activities ranging from religion to conservation. The most important among these implications concerned ethics.

Two stories can be told about the Huxleys in this regard. According to one, they were progressive anti-racists who used science for good. The elder Huxley, a comparative anatomist, marshalled evidence to refute racist pseudoscience. His research countered common beliefs about Africans being

more “ape-like” than Europeans. He railed against the polygenists, who argued that Europeans and Africans were akin to different species and whose writings served as justifications for slavery in the American South. His observations, demonstrating our common humanity, became buckshot in the war against slavery. The Ladies’ London Emancipation Society gathered quotations from his lectures into an abolitionist pamphlet, “Professor Huxley on the Negro Question” (1864), declaring that his scientific work equated to “an earnest plea for Negro emancipation.”

Julian carried on his grandfather’s crusade against race science. With the anthropologist Alfred Cort Haddon, he published “We Europeans: A Survey of ‘Racial Problems’ ” (1935), a book that debunked what its authors called a “vast pseudo-science of ‘racial biology’ ” endorsed by fascist nationalists. The book’s conclusions have since become common sense: The idea of a “pure” race is flawed. What we call “the Germans” or “the French” are in fact mixtures of many ancestral populations. The project of distilling a racially unpolluted people through reproductive policy is scientifically obtuse. Julian fought against Nazism and race science for years thereafter, most famously in the documentary “Man— One Family” (1946) and in his manifesto “*UNESCO*: Its Purpose and Its Philosophy” (1946).

And yet another story can easily be told: Thomas Henry was a racist and an imperialist. According to Bashford, he believed that human variation was organized hierarchically, with the white man presumably on top. Although he was an abolitionist, his rooting interest was with white people. “I have not the smallest sentimental sympathy with the negro,” he wrote his sister Lizzie in 1864, within months of the publication of “Professor Huxley on the Negro Question.” He advocated for emancipation, yes, but “for the sake of the white man”—for his politics, his morality, and his economy.

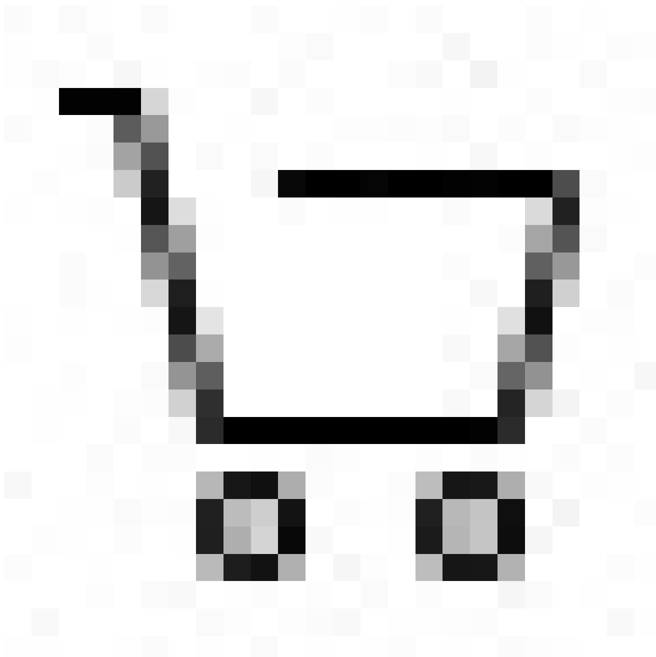


"I'm turning back. This is landfill."
Cartoon by Sam Gross

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Julian doesn’t come out looking much better. He was racially prejudiced and, despite all his talk about “the family of man,” doubted non-Europeans’ sophistication. More damningly, he was a eugenicist—not just vaguely sympathetic but a big-time proselytizer, waving the banner even after the Nazi atrocities, and eventually ascending to the presidency of the British Eugenics Society.

Both stories have their truth, of course, leaving modern interpreters unmoored. Should the Huxleys be celebrated or vilified? In 1969, Western Washington University named its new environmental college after the elder Huxley. Half a century later, in 2021, a task force recommended removing his name because his “white supremacist values” served to “dehumanize and harm many members of the Western community.” The task force’s report was riddled with inaccuracies, many of which were documented in a response from ten Western Washington University faculty members. Still, a more responsible group commissioned by Imperial College London arrived at a similar recommendation: rename Imperial’s Huxley Building and exile Huxley’s bust to the archives. (W.W.U. has removed his name; Imperial will consider adjoining the name of a scientist from a minority group.)

Although Bashford is avowedly sympathetic to Julian, she tends to avoid moral pronouncements, viewing the Huxleys’ positions instead as artifacts

of historical study: examples of the weight of cultural inheritance, snapshots of the ever-changing relationship between evolution and ethics, and paradoxes that illuminate a different way of thinking. She is especially fascinated by eugenics. For many readers, Julian's advocacy might seem incomprehensible. He was an opponent of biological racism and yet a spokesman for population-level genetic planning; a decrier of Nazi atrocities, yet a crusader for sterilization.

But Julian's position was far from unusual. In the nineteen-twenties and thirties, he joined a squad of biologists, including Hermann Muller and J. B. S. Haldane, who combined progressive and sometimes socialist agendas with eugenic fervor. For them, genetic planning was a facet of a modern utopian state: a tool for good that needed to be severed from the corrosive evils of ethnonationalism and racial prejudice.

They laid out their vision in a 1939 manifesto titled "Social Biology and Population Improvement." Published in *Nature* two weeks after Nazi Germany's invasion of Poland, the manifesto called for radical reforms: Establish equality of opportunity. End racial and national discord. Legalize and develop birth control. Provide social welfare, and alleviate burdens on women. Teach people that heredity and the environment interact to affect well-being. Institute a social system that prioritizes "the good of mankind at large." The manifesto was more leftist than was typical for Julian, but its anti-racism, internationalism, and birth-control advocacy were familiar Huxley stances.

A key point of the Geneticists' Manifesto (as it is sometimes known) is that eugenic planning requires these reforms. Our understanding of genetics remains impoverished, it asserted; there is "no valid basis" for assessing the genetic component of individuals' intelligence or temperament as long as they come from unequal social backgrounds. Even so, Julian campaigned for eugenic policies, particularly those connected to health. He was convinced, he said, by data showing that "mental and physical defect runs in families" and that small measures, mostly voluntary sterilization, "could enormously reduce the burden of defective humanity." This advocacy was striking because Julian and his family were members of the targeted group. Not only did they suffer from mental illness—Julian considered it their genetic burden.

The Huxleys had many names for the dark spells that afflicted them. Thomas Henry called them “paroxysms of internal pain.” Julian used the phrase “the malady of thought.” His brother Aldous preferred “accidie,” Chaucer’s term for a “hevy, thoghtful, and wrawe” state. Whatever it was called, Julian deemed it a hereditary scourge.

Bashford locates haunting passages in Julian’s private writings. After the birth of his firstborn, he grieved the torture that his son would inherit: “Your mind . . . will maybe collapse & leave you shelterless, will be ugly, will be so bewitched as to turn (when least expected) from a palace of an Arcadian bower into a pigsty or a prison.” Bashford notes that the words read almost like a curse.

The malady could be crippling. Julian suffered a nervous breakdown before he was supposed to start at Rice, delaying his departure for America by some four months. During another episode, he became near-catatonic—a sad, still, silent facsimile of his usually ebullient self. All the same, he fared better than some other Huxleys did. Thomas Henry’s daughter Marian was despondent after giving birth, and later died in psychiatric care. Julian and Aldous’s brother Trev hanged himself at the age of twenty-four.

Julian, in his autobiography “Memories,” speculated that the malady was genetically inherited, and Bashford offers no alternative explanation. But other observers stress a different inheritance: the heavy expectations levied on the Huxley children and grandchildren. Julian thought that his brother’s suicide was triggered by a failed love affair, but Trev’s “desperate fits of melancholia,” as one biographer put it, began months earlier, after a disappointing performance on the Civil Service exam. “There is something really devastating about having a grandfather (Grand-pater as they called him) who was a god in the family,” Juliette, Julian’s wife, said in a 1985 interview. “These children grew up with that atmosphere: ‘Worthy of Grand-Pater —right! You must be worthy of Grand-pater.’ ”

The sense of unfulfilled potential comes across in Julian’s writings. After his first son’s birth, he wrote, “It is the eternal wish of fathers to instruct their sons in the art of living. They make so many mistakes themselves, they regret so much of life wasted, such energies dissipated, so many hopes on the rocks. Such exquisite possibilities crumbled into nothing.”

If Julian and his grandfather are the stars of Bashford's book, Aldous Huxley is the celebrity who makes the occasional cameo. Best known for his books "Brave New World" (1932) and "The Doors of Perception" (1954), Aldous might seem like a Huxley outlier. Where Julian and Thomas Henry easily fuse into a single long-lived spokesman for evolution, Aldous appears to be something else entirely: a mystical, half-blind novelist; an aloof stork—he was famously tall and gawky—who escaped to the American desert. The English biographer Ronald W. Clark promoted this image in a 1968 book, also titled "The Huxleys." Comparing the brothers in the early nineteen-tens, he wrote that Julian, then a twentysomething zoologist, "showed to formidable degree the traits of TH." The teen-age Aldous, by contrast, was already "so different from the rest, so curiously adult, so like an Arnold."

Yet Aldous was just as much Thomas Henry's grandson. He planned to become a physician until an infection compromised his eyesight, and he maintained a lifelong interest in biology. In 1948, the writer Osbert Sitwell recalled Aldous's knack for talking about arcane biological subjects, including "the incestuous mating of melons, the elaborate love-making of lepidoptera, or the curious amorous habits of cuttlefish." In the final years of his life, Aldous still considered himself "a cheerleader for evolution." And his intellectual companionship with Julian—which unfolded through a decades-long correspondence—was so consequential that the work of each can partly be understood as a dialogue with the other.

Bashford offers glimpses of how Julian and Aldous shaped each other's views, although the better book on the topic is Richard Deese's "We Are Amphibians: Julian and Aldous Huxley on the Future of Our Species" (2015). The brothers, Deese showed, were gripped by similar trends: the centralization of state power, the growth of industrialized society, the transformation of human nature through scientific discovery. Yet they often disagreed about what these trends meant. For Julian, they were engines of progress. For Aldous, they foreshadowed tyranny.

These differences were apparent in projects they worked on in 1931. Julian, a fan of rationally planned societies, invited his younger brother on a tour of the U.S.S.R. Aldous declined. He had to finish a novel, he said, and, besides, he saw evil designs in the U.S.S.R.'s utopian schemes. The next year, Julian published his observations from the trip in "A Scientist Among the Soviets,"

a honey-tongued account of the country's economic and scientific achievements. Aldous, meanwhile, published "Brave New World," his vision of a rational utopia gone wrong. The books drew on similar images of state power—athletic bodies, state-sponsored nurseries, community singing—even as they came to opposite conclusions about the significance of such power.

Julian influenced "Brave New World" beyond supplying an ideological sparring partner. The novel explored futurist speculations that Julian had put forward in "What Dare I Think?" (1931), including a designer drug that would one day be taken by millions. The novel further drew on Julian's work in having Mustapha Mond, the face of the dystopian government, come across a paper arguing that evolution favored expanded consciousness, a view that Julian had expounded in several recent books. H. G. Wells considered "Brave New World" an attack on his own utopian daydreams, but the book can also be read as an extended letter from one future-obsessed brother to another.

Thomas Henry Huxley and Bishop Wilberforce debated evolution that day in 1860 because Darwinism was dangerous. By explaining the origin of species without divine intervention, it threatened to destabilize Christianity. God was elbowed out of the picture, replaced by an impersonal process of survival and reproduction. When we extrapolate this conflict to the modern day, it is easy to see evolution and religion as fundamentally incompatible, especially since some of evolution's most vocal apostles, like Richard Dawkins, rank among religion's most fiery opponents.

The irony is that Huxley was a fan of religion. When running for the London School Board in 1870, he proposed that two hours be allocated weekly to religious instruction. He supported Bible readings in school, which he thought useful for cultivating morality. He also studied Biblical history with rabbinic care. Although he is remembered for his research on crayfish, gorillas, and marine invertebrates, his notes on the Old Testament far exceeded what he compiled on any of those critters. He devoured Jewish history and trawled Biblical scholarship, producing his own "Genealogy of the Horites and Genealogy of the Edomites." An agnostic through and through, he believed that the generations and chronologies of Genesis made

no sense but thought that other statements in the Old Testament might be true.

For Huxley, evolution meant not the end of religion but, rather, religion's reconstruction—"a new ethical formula, a new set of beliefs, a new pattern of rules by which humanity might live," in Ronald Clark's words. His heirs Julian and Aldous took up this pursuit, seeking traditions that were both compatible with science and resonant with humanity's religious impulses. Predictably, though, the brothers ended up with different creeds.

Julian developed what he called "evolutionary humanism," a mashup of his favorite progressivist themes. It featured in many of his lectures and books, although he discussed it in greatest detail in "Religion Without Revelation" (1927). Central to the ideology was humanity's purpose: we are the children of a cosmic process that produces ever-greater intelligence and complexity. There could be no more important common aim than to take control of that process—to overcome our individual and tribal identities and achieve the more advanced mode of collective existence he called transhumanism. Evolutionary humanism, given its focus on the betterment of the species, became welded to eugenics. This might explain why, as eugenics lost legitimacy, evolutionary humanism became all but forgotten.

Where Julian focussed on unity and transhumanism, Aldous turned to experience. As an undergraduate at Oxford, he wrote to Julian about his conviction that the higher states of consciousness described by mystics were achievable. The fascination persisted, and, by the nineteen-thirties, Aldous believed that society's aim should be to nurture the pursuit of enlightened consciousness. By the time he published "The Doors of Perception" (1954), which connected his experience on the drug mescaline to the universal urge for self-transcendence, he had been writing and lecturing on mystical experiences for decades. Through this commitment, Aldous helped pioneer a form of secular mysticism that suffuses modern attitudes, showing up in things like New Age yoga and psychedelic-assisted therapy. An inheritor of evolution, the half-blind stork wrested sublime experience from the caverns of institutionalized religion.

The history of the Huxleys reveals a paradox in how we think about evolution. On the one hand, it exemplifies our impulse to find answers in

cosmology. As organized religion declined, people sought guidance and justification in the scientific narratives taking its place. From race science to eugenics, progress to spirituality, the Huxleys combed our deep past for modern implications, feeding an ever-present yearning.

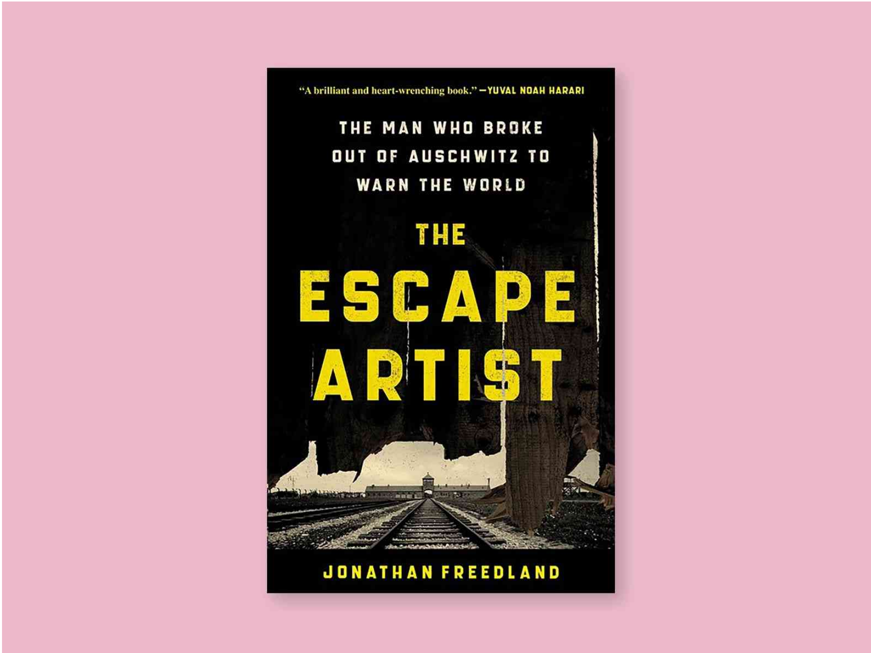
On the other hand, the Huxleys expose how diverse and historically contingent those implications can be. Evolution is a messy, nuanced, protean picture of our origins. It offers many stories, yet those which we choose to tell have their own momentum. It can serve as a banner of our common humanity or as a narrative of our staggering differences. It can be wielded to fight racism or weaponized to support oppression. It can inspire new forms of piety or be called on to destroy dogma. The social meanings of evolution, like so much else, are part of a grander inheritance. ♦

By Janet Malcolm

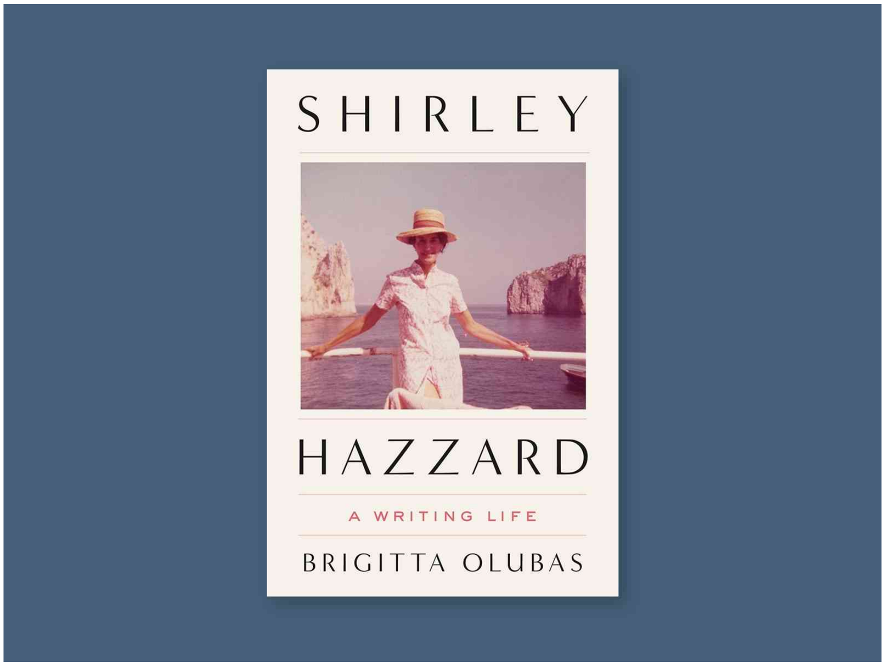
By Robert A. Caro

By Patrick Radden Keefe

By Philip Gourevitch



The Escape Artist, *by Jonathan Freedland (Harper)*. In 1944, the Auschwitz escapee Rudolf Vrba, intent on piercing the “veil of ignorance” surrounding the Nazis’ crimes, related his and others’ experiences of the camp in the Vrba-Wetzler Report. Disseminated in the midst of the war, the report catalyzed an international response that would ultimately spare two hundred thousand Hungarian Jews. With the propulsion of a historical thriller, Freedland, a journalist, tracks Vrba’s work collecting the “data of the dead” even while imprisoned, driven by his conviction that facts could perhaps derail the Nazi extermination plan. As Freedland depicts world leaders’ failure to act expeditiously, he observes, “A horror is especially hard to comprehend if no one has ever witnessed anything like it before.”

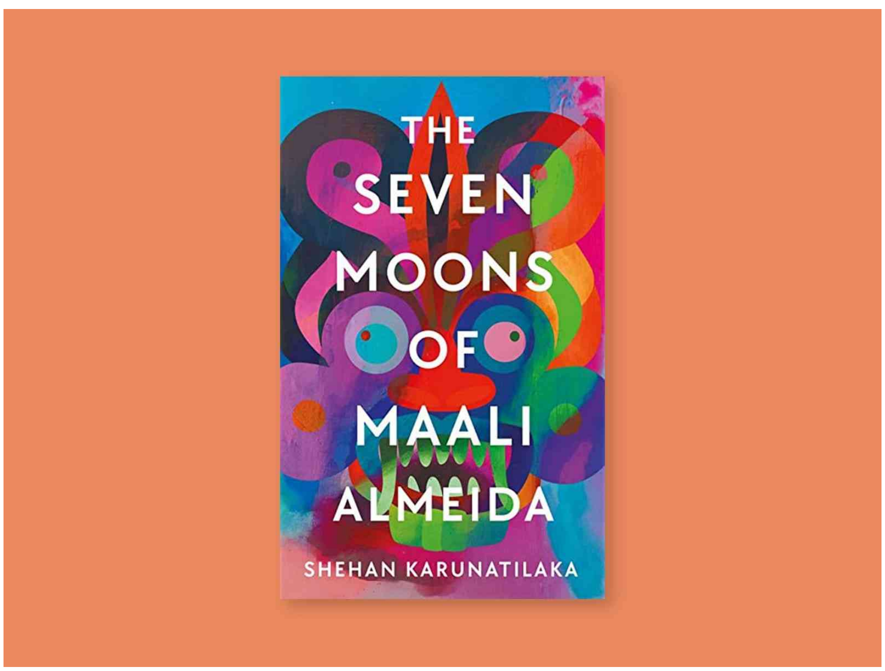


Shirley Hazzard, *by Brigitta Olubas (Farrar, Straus & Giroux)*. This biography of an acclaimed novelist follows Hazzard from her early years in Australia and postwar Hong Kong through her adulthood among storied literary circles in New York City and Italy. Olubas traces the development of Hazzard's longtime preoccupations with "mobile protagonists and their shifting worlds," and with questions of truth, goodness, knowledge, and perspective. Carefully crafted—a page could be revised as many as thirty times—and signalling a "deep investment in destiny," Hazzard's richly layered novel "The Transit of Venus" led her husband, the biographer and Flaubert scholar Francis Steegmuller, to remark, "No one should have to read it for the first time."

The Best Books of 2022

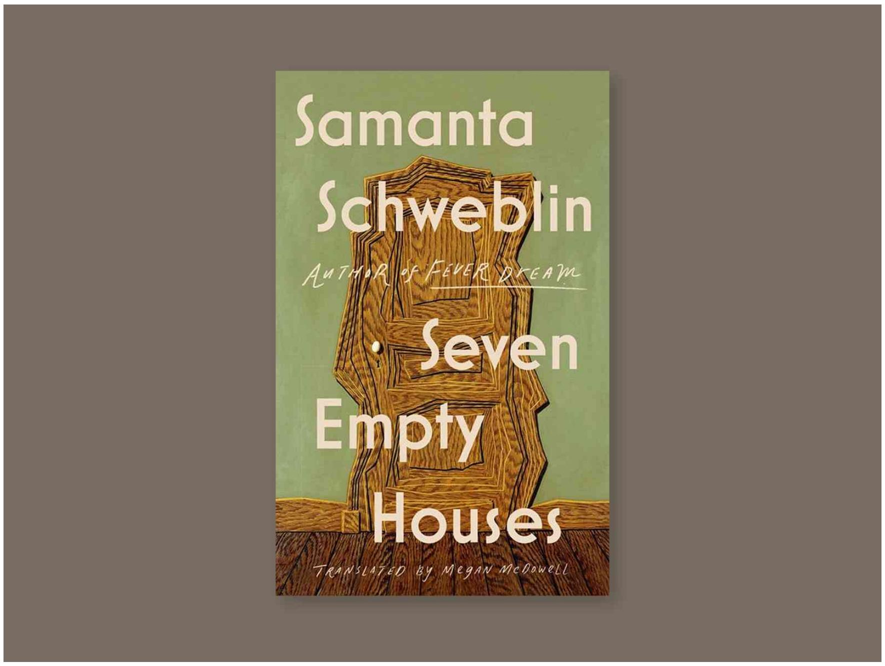


Read our reviews of the year's notable new fiction and nonfiction.



The Seven Moons of Maali Almeida, *by Shehan Karunatilaka (Norton)*. In this magic-realist satire, the title character—a self-described "photographer, gambler, slut"—wakes up in the afterworld and has a week to discover who killed him. Set during the civil war in Sri Lanka in 1989, the novel follows

Almeida as he attempts to find his murderer and help two friends obtain a cache of photographs incriminating those on all sides of the conflict, before they are purloined by others searching for them. The group includes government officials, separatist Tamil Tigers, communist rebels, Indian peacekeepers, and arms dealers, all of whom are willing to kill to accomplish their mission. When Almeida tracks down his murderer, he realizes that "every death is significant, even when every life appears not to be."



Seven Empty Houses, *by Samanta Schweblin, translated from the Spanish by Megan McDowell (Riverhead)*. The seven stories that make up this haunting book, by an Argentinean novelist, feature characters confronting their own estrangement—from their families, their neighborhoods, and themselves. In one story, the narrator and her mother rearrange parts of strangers' homes, an act that encapsulates the sense of alienation inspired by the houses of the book's title. In several tales, children die or disappear, leaving behind adults incapable of coping with loss. While Schweblin's shorter stories often rely too heavily on elision, the longest, about an elderly woman with dementia who observes her mind's deterioration, is deeply affecting.

By The New Yorker

By Lauren Collins

By Joshua Rothman

By Keith Gessen

Comment

- **The Return of the Wild Turkey**

The Return of the Wild Turkey

In New England, the birds were once hunted nearly to extinction; now they're swarming the streets like they own the place. Sometimes turnabout is fowl play.

By Jill Lepore



Rats should take notice, pigeons ponder their options: wild turkeys have returned to New England. They're strutting on city sidewalks, nesting under park benches, roosting in back yards—whole flocks flapping, waggling their drooping, bubblegum-pink snoods at passing traffic, as if they owned the place. You meet them at cafés and bus stops alike, the brindled hens clucking and cackling, calling their hatchlings, their jakes and their jennies, the big, blue-headed toms gurgling and gobble-gobbling. They look like Pilgrims, grave and gray-black, drab-daubed, their tail feathers edged in white, Puritan divines in ruffled cuffs.

"There was a great store of wild turkeys, of which they took many," the Mayflower arrival William Bradford wrote in his journal, during his first autumn in Plymouth, in 1621. Bradford didn't eat turkey at that first Thanksgiving, because, really, there was no first Thanksgiving that fall. Also, much of the food that he and his band of settlers ate they had taken,

like their land, from the Wampanoag, and at the harvest celebration in question he may have eaten goose. But turkeys abounded. And no reader of the annals of early New England has ever forgotten Bradford's recounting of the public execution, in 1642, of a boy, aged sixteen or seventeen, hanged to death for having had sex with "a mare, a cow, two goats, five sheep, two calves, and a turkey." (A turkey?) Benjamin Franklin, writing in 1784, thought the turkey "a much more respectable Bird" than the bald eagle, which was "a Bird of bad moral Character," while the turkey was, if "a little vain & silly, a Bird of Courage." Alas, by the end of the nineteenth century this particular fowl had nearly become extinct, hunted down, crowded out. The last known wild turkey in Massachusetts was killed in 1851, even as Americans killed passenger pigeons, by the hundreds of thousands, from flocks that numbered in the hundreds of millions. The last passenger pigeon, Martha, named for George Washington's wife, died in a zoo in Cincinnati, in 1914, and, not long afterward, heartbroken ornithologists tried to reintroduce the wild turkey into New England, without much success. Then, in the early nineteen-seventies, thirty-seven birds captured in the Adirondacks were released in the Berkshires, and their descendants are now everywhere, hundreds of thousands strong, brunching at Boston's Prudential Center, dining on Boston Common, and foraging alongside the Swan Boats that glide in the pond of Boston Public Garden. They most certainly do not make way for ducklings.

Birds, over all, are not faring well. Ornithologically, these are dystopian times, an avian apocalypse. One recent study estimates that the bird population of North America has fallen precipitously since 1970, down nearly three billion birds, one lost for every four. Not wild turkeys, whose numbers in New England are still rising. They eat everything: worms, hot dogs, sushi, your breakfast, grubs. They are fairly flightless and eerily fearless, three-foot-tall feathered dinosaurs.

If they look like Pilgrims, petty, pious, they also bear an uncanny resemblance to a mouthwatering main course, perambulating. Cows don't walk down Commonwealth Avenue, but if they did would they give you a hankering for a hamburger? If lambs grazed on the outfield at Fenway Park, would the sight of them leave you licking your lips at the thought of lamb chops, roasted with rosemary and lemon? Or would making their closer acquaintance convert you to vegetarianism? People don't meet their food

anymore, even if they go to farmers' markets and farm-to-table bistros. But a turkey sashays past your office window and a cartoon thought bubble pops up above your head, of that turkey on a platter, trussed, stuffed, roasted, and glistening, the bare bones of its severed legs capped in ruffled white paper booties. Do you forswear fowl? A fat tom walks by, proud as a groom. "If only I had a musket," you hear someone say. "I mean, or I could just grab it." Except, scofflaw, you can't.

In Massachusetts, you can hunt wild turkeys (since 1991, the state's official game bird), but only with a permit, only during turkey-hunting season, and only so long as you don't use bait, dogs, or electronic turkey callers. You are, to be fair, permitted to whistle. "Sit and call the birds to you," the Massachusetts Division of Fisheries and Wildlife advises. Yet beware: "Do not wear red, white, blue, or black," or the gobblers, the full-grown males, might attack. Franklin offered the same caution: if a turkey ran into a British redcoat, woe to the soldier. This, my fellow-Americans, may be how we won the war.

"Don't feed the turkeys," one city office warns civilians, of the non-hunting sort. They may attack small children. (Small children's approach, however, may prove difficult to deter.) "Don't let turkeys intimidate you." To daunt them, the henpecked advise, wield a broom or a garden hose, or get a dog. You sometimes see people standing their ground, a man chasing a squawking flock off his front porch, waving his arms. "Tired of the turkey shit on my steps," he snaps. A bicycle cop veers into a hen, on purpose, a near-miss, urging her away from a playground: "Scram, bird, scram!" And still the turkeys gain ground: the people of New England appear indifferent to the advice of the Division of Fisheries and Wildlife, recalling childhood afternoons spent in schoolrooms, placing a hand on construction paper and tracing the outline of splayed and stubby fingers to draw a tom, its tail feathers spread wide. A turkey seemed, then, an imaginary, mythical animal—a dragon, a unicorn. And here it is! Roosting in the dogwood tree outside your window, pecking at the subway grate, twisting its ruddy red neck and looking straight at you, like a long-lost dodo. What more might return in full force? Will you ever see a moose in Massachusetts? A great egret in Connecticut?

Thanksgiving looms, a much trussed holiday. Meanwhile, night after night, sitting under heat lamps on the sidewalk in front of every neighborhood pizza place, diners toss oil-shimmered crusts to a rabble of turkeys, a muster of toms, a brood of hens, a mob of poults. “A Pilgrim passed I to and fro,” William Bradford once wrote. And there, a-gobbling, the new pilgrims go. ♦

By David Remnick

By Jelani Cobb

By Margaret Talbot

By Patricia Marx

Crossword

- **The Crossword: Friday, November 18, 2022**

By Paolo Pasco

Fiction

- **“The Hollow Children”**

The Hollow Children

By Louise Erdrich



Audio: *Louise Erdrich reads.*

At the Tabor Bar, around beer No. 4, the men sometimes got into history farming, trading stories of their antecedents' exploits and agonies. In the long ago, wheat prices had plunged and most of the bonanza farms had broken up. That was when their great-greats had bought the land. The men talked about old plagues, old equipment, old swaps of ownership, crops, land, and dire weather. John Pavlecky's great-grandmother, at the age of nine, had survived the blizzard of 1923 by burrowing into a nearby haystack when the school bus didn't show up. Diz remembered his grandfather telling stories about an Uncle Ivek, who had also endured that blizzard, which was particularly lethal because it happened on a misty and mild April day. Around eight that morning, the bus had been almost full of children and headed toward the school, when out of the northwest a wind of sixty miles per hour had dropped the temperature instantly to minus twenty and filled the air with a blistering-cold curtain of powder. Such a snow could blind your eyes and scour the features off your face.

Ivek was a farmer, a part-time schoolteacher, and one of the bus drivers. He was taking his turn behind the wheel. In the back of a school notebook, not long after the blizzard, he wrote about what happened.

Ivek was bouncing down the muddy road when the mist dissolved and he saw it—a boiling white mass rolling at him like annihilation. He drove straight in at full speed, hoping to make it the rest of the way on sheer momentum. But in the whiteout he slowed to a crawl. Then crept along, feeling through the tires for the road. The children had gone dead silent.

Louise Erdrich on blizzards and vulnerability.

The silence lasted until Ivek lost his feel of the road and knew that they had left it. The earth on either side of the Red River had been rolling-pinned by a vast and ancient glacier. The flat fields and prairie were of a time eternal, and the human presence in that expanse was slight. The children knew it, and he knew it. They had to keep moving or die. Luckily, he'd filled the gasoline tank.

"How about a song?" Ivek shouted.

"What shall we sing?" the Viveky boy called out from a few seats back. His voice trembled. Perhaps he thought that a church hymn would insure their admittance to Heaven.

"We shall sing 'Wild Clover.' "

Ivek hadn't noticed the girl. She touched her hand to his shoulder. It was Agnid Awbrey, daughter of a Welshman and an Irishwoman, a steady girl of eleven years, whose upbringing had been of the finest sort. From her mother, fearless good cheer, and from her father, a soldier who'd fought in Mesopotamia, drinking songs adapted for childish ears. She began. And she taught the other children the words as she went along, just the way Ivek taught his students to learn poems and stirring speeches by heart:

> I've been a wild clover all summer long
> And I've spent all my money on sunlight and song

But now I am falling asleep under snow
So I can return as wild clover once more.

And it’s yes, yea, ever
Yes, yea, ever and more
Shall I be the wild clover
Yea, ever and more.

The song went on, amended verse after verse, with clapping and stamping on the chorus. It roused Ivek’s heart and he roared the chorus, too. When the children were tired of that song, there was another:

Fiery pillar on our journey
Lead us through the snow
Fire, fire, fire, fire.

This one was also accompanied by stamping, pounding, clapping, and roaring. Agnid had probably made it up to keep them warm. But the children eventually quieted, spent.

Ivek kept the school bus moving, sometimes jerking across the prairie and at times gliding on roads, determined not to drive into a ravine or be stopped by any means other than a warm house or a barn. His heart sped up so fast that he could hardly breathe. He thought of a child—Mary Wacha, so quiet and so good at math. Or Warwick, the boy who chopped wood for the school stove. Or small-boned Morris, only five years old, whom he’d directed Agnid to bundle in the blanket that usually draped his lap. He would get the children out of his mind only to have their parents crowd in. He knew the parents were praying that the bus had reached the schoolhouse before the worst hit. He thought of his friend John, whose child, the last on his route, he hadn’t picked up. Was she wandering in the blizzard? And Agnid’s father and mother, and his own wife, her dark hair all in a braid down to her waist. She was at home, and he was glad now that their children had been ill that morning and stayed with her. She would be praying, too. He put her out of his mind and drove on. And on. There was no telling. No telling which direction he was going and he knew not where he was. He knew only that he must not stop.

Podcast: The Writer's Voice
[Listen to Louise Erdrich read "The Hollow Children."]

"The others are hungry," Agnid said at last. "I myself have a meat pie so great I cannot eat the whole. Shall I direct us to surrender our lunches and divide the food?"

"Yes." Ivek spoke without taking his eyes off the nothingness.

"Then I will," she said, "and fairly, in spite of the Spiral boys."

Ivek smiled even in their peril. "Have they given you trouble?"

"I have them in hand."

Ivek heard the sounds of negotiation and discussion, voices kept low. He was in a cold sweat because, after a long stretch of flat surface, which he'd thought was possibly the Meridian Road, the bus was bumping over hummocks that didn't feel like snow. For some reason, he imagined that it was a graveyard, although of course that was absurd. But then he felt a terrible slickness beneath the wheels. The bus skidded and his heart dropped. He was either farther south or farther west than he'd thought. They hadn't gone down a steep riverbank, so he understood that they were on one of the arms of the deep lake that curved intimately below Tabor. And now, though he knew that it was unlikely in the extreme, his blighted mind reviewed the recent stretch of mild days and seized on the vision of the bus plunging to the bottom. He knew that the ice should still be sound throughout the lake, yet his unruly thoughts continued.

Agnid tapped his shoulder and he nearly shrugged her off, but she reached around with the meat pie and let him know that the children had agreed he must have it. The instant he bit into the pie, his wheels found purchase. The roads were all straight section roads, though often little more than trails. Reading the way the snow was settling, he renewed his commitment to steering within a few degrees of center, creeping along even more slowly, peering down through the edge of his window, which he'd been forced to open a crack. He nosed at the drifts and used a bit of speed to grind through them, always returning to the central line. He went on, on, and on.

The wind toyed with the bus, sometimes booming at its sides, sometimes sliding with a low whistle along the window tops. At times, it reached below the hood and shook the engine like a baby's rattle. Ivek would shout to the children, "Sing that song! Sing that song about the fire!" The children sang for as long as they could. His sweat froze on his forehead. His leg shook as he pressed and let up on the brake. He blinked quickly so he wouldn't run into a tree, few though they were. His mouth was so dry that his tongue was swelling. Staring desperately hard, he wondered about snow blindness. When the light assumed the flat bluish cast of skim milk, he knew that dusk was upon them, and they fell into the lake.

It wasn't, as he'd imagined, an icy plummet. The water seized them so swiftly that there was no fear or pain, and the fall was surprisingly gradual. They rocked and swayed, lakeweed swirling around their necks and ears. Startled fish swam to the door and by instinct he let them in. He knew that he and the children were all lost forever. He didn't like his thoughts, but he was still glad that his son and his daughter were safe at home in the warmth of a good stove. He thought of them burning the wood that he'd chopped. There was plenty. But then he heard their voices behind him and realized that they had got on the bus after all.

Sorrow cascaded over him as the bus settled on the bottom of the lake. When there was no use steering any longer, he rose in his grief and turned to the children. He meant to apologize and hoped to recommence the singing, but the children had changed. By unknown means, on the way down to the bottom, the children had become hollow. They were transparent and so frail that they were almost unbearably weighted down by their clothing. Sagging and faint, they listed in the seats, their skin membranous and glistening. Ivek knew that he must not allow them to guess how precarious their existence was, so he went down the center aisle collecting their coats. Once they'd shed their coats, some shot through the windows to the surface, while others would, he realized, spend their days at the bottom, waiting for their families to come to the lake and let down a line they might grasp—

—hold of?

Ivek's eyes were open but somehow they opened. He was once again driving on the surface of the blinding earth. He caught a glimpse of the school to the

left of the bus before snow slammed shut over the sight. He doubted what he'd seen, but his arms had faith. His hands guided the wheel according to his vision. He sensed that they were in the shadow of something large, a building. He pulled closer to the side. Idled the bus. It was the school. In the lee of the storm, he could see the familiar boards that he himself had painted.

He stopped the bus. Opened the door. Wind almost sucked them out. He closed it again and instructed Agnid to sort out her classmates. They lined up in the aisle and made a chain of themselves behind the largest boy, a Spiral, with the smaller children in the middle, and, at the end, Ivek, with Morris grappled to his chest.

The wind wrestled with them as they labored around the side of the school to the door, tumbled in. The children scrambled up and rushed to the stove. Ivek, who always set up the next day's fire before he went home in the evening, unclenched his fingers, clumsily opened the tin matchbox, lighted a cone of newspaper. Fire leapt from the paper, snapped to the splinters of bark. Ivek stood back behind the children, as they crowded close, and the blaze rose up.

Or did it?

The chill in Ivek was far deeper than the fire could touch. The reality of the cold world beneath the ice was stronger than the warmth of the school. He turned away from the stove so the children wouldn't see his tears. What was up and what was down? If he turned back, would the children still be warm and alive? Gritting their teeth in pain and happily whimpering as their numbed feet and fingers prickled to life? Or would they be frail blue human bubbles he'd failed to rescue? Would his son and his daughter be among them? Dissolved to froth? He closed his eyes. Again, he was down there with the fish darting in and out, lakeweed clogging the children's mouths, each seat inhabited by a small, vanished life. And who was he? The driver or the one driven from existence by relentless snow? He reached—

Agnid pressed into his open hand a cup of snow she'd melted. He looked at her. She was sturdy. The water was hot, steeped with a piece of boiled wool she'd cut away from her coat. This was, she said, an old cure that her mother

used for wind sickness, times when the mind could no longer bear the wind's moans and mumbles and a person started hearing human voices.

He took the cup, drained it down. It tasted horrible, and he was cured.

Or, rather, he was better. For the drive would leave its mark upon him in a way that someone who had not seen those children, blue and hollow under the lake, would never understand. That was why he wrote it down. ♦

By Deborah Treisman

By Janet Malcolm

By Robert A. Caro

By Patrick Radden Keefe

Insulation Dept.

Juvenilia Dept.

- **Portrait of the Artists as Young Weirdos**

Portrait of the Artists as Young Weirdos

Nauseatingly shaky camerawork! Anthropomorphic Silly Putty! A "To Catch a Predator" mock epic! It's the Childhood Delusions Film Festival, wherein adults submit homemade films shot when they were kids.

By Reyhan Harmanci



Curtis Whitear, a thirty-five-year-old documentary filmmaker, was sitting in front of two monitors in his apartment in Ditmas Park recently, watching movies made by kids. He opened a file of a film made by a friend named Ash Sanders. "This is what she called 'The Putty Movie,' " he said. She made it when she was sixteen.

He clicked and the "Mission: Impossible" theme played. Two girls dressed in camouflage sneak around a house, arms aloft in victory. The soundtrack changes to nineties house music, and one of the girls sprints down a driveway and jumps on the hood of a moving car. "This whole section has such a good ambient quality," Whitear said. Finally, dialogue: "We have something that belongs to you," a voice says. "Recognize *this*?" Cut to a flesh-colored mound of Silly Putty with googly eyes, and a complicated

discussion of why half the putty is being held captive at another location. The voice grants the putty a last wish, “a song to express her undying love for you.” “Hold Me Now,” by the Thompson Twins, is heard over a montage of pictures of a blond teen boy.

Whitear, who wears round, owlish glasses and has messy blond hair, was culling submissions for a special screening event—his birthday party, which he is calling the Childhood Delusions Film Festival. He had e-mailed a few dozen friends with a request to send him movies that they’d made when they were kids. “These cringey masterworks deserve to finally be seen on the big screen,” he wrote. “So I am renting a movie theater and making that happen! It’s like a gift from a 35 year-old me to a 12 year-old you, except not creepy at all.” There were a few rules: submissions couldn’t be longer than five minutes or be made after someone turned twenty-one.

Despite the time rule, not all of the people who sent in digital files (and DVDs and CDs) had edited down their juvenile masterworks. Some submissions were raw tape, hours of filmmaking attempts piled one on top of the other. In some cases, what the filmmaker thought would be the most interesting part wasn’t. A podcast producer named Abigail Keel sent in one such VHS tape. “She was specifically asking me to look for this video of her and her Mexican exchange student,” Whitear said. “They made some kind of kung-fu thing together.” What he found more compelling is a scene that she and her girlfriends made about a diva-ish pop star. He clicked: Grainy footage of a tween girl holding a hairbrush as a mike, talking to another tween, who is the “mother.” The “pop star” tells the mother that she’s not even invited to her show and should think about “life—you need a new one!”

Next up, a black-and-white short of a pool game from the perspective of a shy cue ball, which whispers, “I didn’t mean to break up your little pack.” Then an eleven-minute epic, a spoof on “To Catch a Predator,” made for English class. It depicts a dystopian plantation led by a high-school kid in a preppy pink shirt. Then an impressive stop-motion piece populated by Lego figures, showing a bank heist. Whitear planned to edit his final picks for time, but not for content. “You have to let them have the childhood logic,” he said. He hoped to show something from everyone who submitted, except for a video composed of hand-drawn storyboards about the relationship

between a child and his dolls. It was too long, but its creator had declared that it could not be touched.

Finally, Whitear took a look at his own submission, a seventeen-minute film called “The Black Sun,” which he made when he was twelve. The original cut was ninety minutes; watching it, he said, was “absolutely unbearable, like, five-minute sections of no dialogue, really bad.” Shooting it with a handheld camera had made him so nauseated that his grandfather bought him a tripod. One of the film’s stars, Whitear’s cat, Mr. B, died during the six weeks of filming. Over the years, Whitear has reëdited it multiple times.

“I’m going to call this ‘The Final Super Director’s Cut,’ ” he said. Like the other young auteurs, he’d designed his own title card—in his case, a fake Twentieth Century Fox logo, with fanfare. The action begins with a boy rolling down a suburban hill; he is a federal agent exploring a private island that is inhabited by stop-motion dinosaurs. Whitear smiled at his younger self on the screen. “Every time I make a new version of this, I show it to a lot of people, and no one is, like, ‘Yeah, Curtis, I see why you love this movie,’ ” he said. “But I’m still working on this. I can’t quit it.” ♦

By Benjamin Wallace-Wells

By Barry Blitt

By Thomas Beller

By Isaac Chotiner

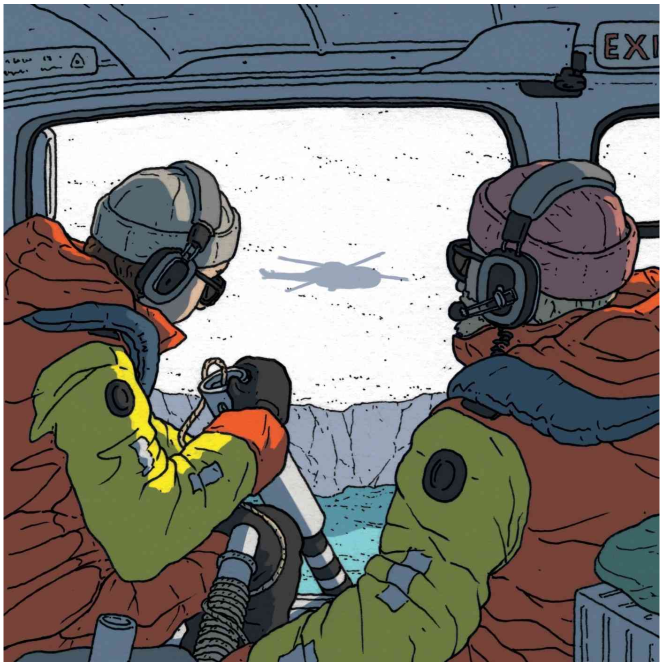
Letter from Antarctica

- **Journey to the Doomsday Glacier**

Journey to the Doomsday Glacier

Thwaites could reshape the world’s coastlines. But how do you study one of the world’s most inaccessible places?

By [David W. Brown]



I first saw our icebreaker, the RV Araon, when we were due to leave for Antarctica. The largest icebreakers are more than five hundred feet long, but the Araon was only the length of a football field; I wondered how it would handle the waves of the Southern Ocean, and how it would fare against the thick sea ice that guards the last wilderness on Earth. Its hull was painted a cheerful persimmon color, and its bow was conspicuously higher than the rest of the ship, with a curved shape suggesting that icebreakers don’t so much carve through ice as climb and crush, climb and crush. It was January 3rd, summer in New Zealand. In the heat, ice was a little hard to picture, let alone icebreaking.

Our voyage would last two months. We would spend a week or so sailing from Christchurch to the edge of Antarctica, then break through the pack ice of the Amundsen Sea, before arriving at Thwaites Glacier—one of the fastest-retreating on the continent. Our expedition was led by the Korea Polar Research Institute, which had brought some forty researchers from

around the world to the Araon. They would have a month at Thwaites to conduct their respective research projects before the return trip began.

I had been "on the ice," as Antarctic explorers say, once before, in 2019, while researching a book. There's no room for passive observers on the most remote expeditions, and so, on that trip and this one, I'd signed on as a field-research associate, sponsored by the University of Texas Institute for Geophysics and the G. Unger Vetlesen Foundation, an Earth-science nonprofit. For the second time, I would be working alongside Jamin Greenbaum, a forty-two-year-old scientist at the Scripps Institution of Oceanography, at the University of California, San Diego. We'd be hurling torpedo-shaped probes from a helicopter into cracks in the ice, with the aim of studying the warm ocean water that is melting Thwaites from below.

We had successfully placed sensors in the water during our first expedition, on the eastern side of the continent, throwing them from the back of a refurbished cargo plane from the Second World War. We weren't sure we could repeat this feat. Weather on Thwaites is notoriously hostile, and, because dense cloud cover makes satellite reconnaissance virtually impossible, we wouldn't be able to identify promising fissures until we were flying over the ice. Greenbaum's style of adventure is less romantic than world-weary. "Antarctica occasionally lets you pull something off," he told me. "But not often."

The continent is shaped like a hitchhiker's fist, its scraggly thumb pointing west. Thwaites, which is named for a late, eminent geologist, is on the southern side of the thumb, where it meets the hand. There are bigger glaciers elsewhere in Antarctica, and they are also showing signs of weakness, but Thwaites is especially concerning. Its adjoining ice shelf—a large floating expanse of ice, which extends from the glacier out over the water—acts like a cork in a wine bottle, holding much of the rest of the glacier in place. If the cork decays and gives way, the glacier could begin to flow rapidly, and eventually it and a larger stretch of surrounding ice in West Antarctica might slide or calve into the ocean. Thwaites is often known as the Doomsday Glacier, because, in this worst-case scenario, sea levels could rise by several feet or more, inundating many of the world's low-lying coastlines.

Thwaites is already retreating—that is, it is shrinking, as more of its ice flows into the sea. Glaciologists and geophysicists want to figure out whether a colossal "retreat event" is likely to happen in fifty years, a hundred years, or five hundred years. To investigate the situation, our expedition would explore Thwaites by land, sea, and air. The Araon had seawater laboratories, underwater probes, and two helicopters; it also carried drones, snowmobiles, a disassembled hot-water drill, Zodiac watercraft, and a subsurface glider—a kind of robotic dolphin—that could take seawater measurements autonomously. Yet all of this would be useless if we couldn't get to Thwaites, which is one of the least accessible places on the planet. To reach the glacier by air, you must first travel overland to construct an improvised airport. Go by sea, and there's a good chance that your ship will get overwhelmed by ice and be forced to turn back. David Holland, a mathematician and an Earth scientist at New York University, and a member of our expedition, told me, "There are many bad ways to do this, and we've found all of them."

The Araon's science crew included three researchers—Lucas Beem, a geophysicist; Jamey Stutz, a geologist; and Christopher Pierce, a graduate student in engineering—who would fly in a specially equipped helicopter to scan Thwaites with radar. As we gathered at the Christchurch docks with our luggage, I looked between them, past bobbing sailboats, to where behemoths the size of oil tankers loomed. When I was a kid, my father worked on the Mississippi as a tugboat mechanic and pilot, and I sometimes tagged along as he sailed from the dock near our trailer, in St. James Parish, to the Port of New Orleans and back. I've seen big ships and small ones, and I could tell that the Araon was strikingly small.

"Are we sure this is the right boat?" I said, to no one in particular.

There were a few nervous laughs.

"Place your bags on the net," a Korean dockworker said. He'd covered the ground with thick cargo netting. We set our bags where we were told.

"This way," another worker said, waving us along like a traffic cop.

A gangplank stretched from dock to ship. Once I crossed, the Araon would be my home until March. I hesitated, then made my way across the chasm.

Earth's climate system has a single goal: to make the temperature the same everywhere. Hot air and water flow naturally from the equator to the poles. Because heat rises, one might expect currents of warm water to travel near the ocean's surface, but things aren't that simple: at tropical latitudes, the sun is stronger, evaporating more water than it does elsewhere, and the warmed seawater ends up slightly saltier and denser. It sinks. Near the poles, warm currents flow beneath cold ones.

Warm water, therefore, used to arrive at Antarctica safely stowed in the deep ocean, well below the level of its continental shelf—the portion of a continent that extends underwater. For the past fifty years or so, however, a changing atmosphere has been reorganizing the world's winds and currents. For a number of reasons, the warm, dense, salty water around Antarctica has begun creeping toward the surface. Antarctica has the only continental shelf whose interior is deeper than its periphery—it is essentially a bowl, shaped partly by the weight of miles-thick ice pushing down. The warm water is now slipping over the edge of the bowl, then sliding in and eating the ice from below.



"I blame the government for everything. What do you do?"
Cartoon by Kaamran Hafeez and Al Batt

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Many scientists have investigated Thwaites. In 2019, Anna Wåhlin, of the University of Gothenburg, and her team used an autonomous submarine to collect data from beneath the glacier for the first time. Greenbaum's goal was to place sensors closer to the heart of Thwaites, studying ocean currents

and other processes unfolding there. Before turning to Antarctic research, he had worked on Mars rovers and other missions for *NASA*’s Jet Propulsion Laboratory; later, he earned his Ph.D. under Donald Blankenship, a polar geophysicist who built an informal, international network of researchers studying Antarctica. Greenbaum had learned to love the difficult work of building globe-spanning coalitions to gather data about remote and perilous places.

The morning after the Araon set off, I woke in the cabin that I shared with Greenbaum to find that the ship was skipping waves like a cigarette boat. I flossed, brushed, and tried to come to grips with the pervasive thrum of the engines. The ship’s interior was utilitarian, with metal floors and walls; I anxiously eyed the chrome grab handles that studded the bulkheads as I walked in search of breakfast.

In the nearly empty galley, Holland sat with Clare Eayrs, a quick-witted research scientist at N.Y.U. Abu Dhabi who studies how snow affects ice-shelf thickness. I fixed a plate from the Korean buffet and joined them. Holland and Eayrs were prepping for an interview about their research, which Holland would conduct by satellite. They ran through subjects to cover—rapid sea-level rise, marine-ice-sheet instability, the ocean and the atmosphere—while Holland made notes on a flap from a cardboard box.

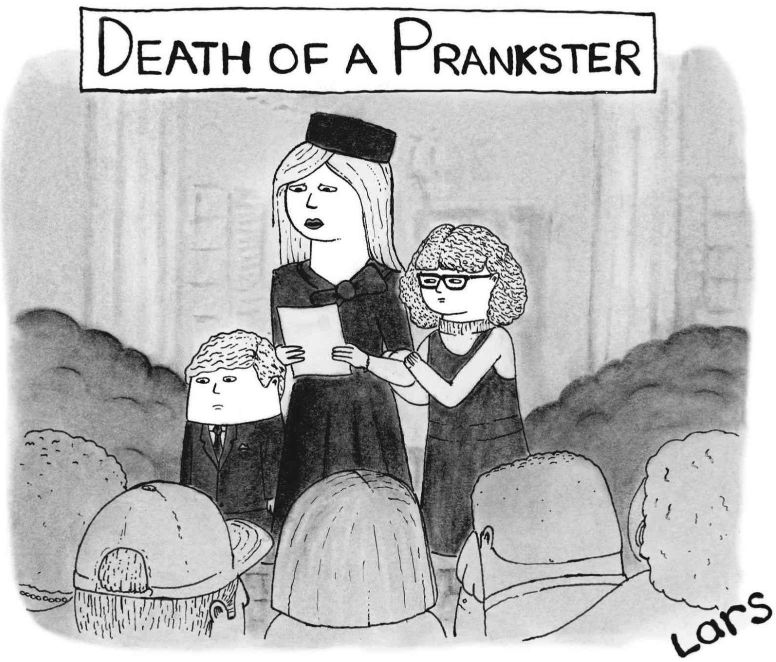
“This is a lot for four minutes,” Holland said, chewing.

Eayrs agreed. “Marine-ice-sheet instability alone could take up the whole interview,” she said. Holland crossed it off the flap.

If humanity didn’t exist, Antarctica’s ice sheet—the layer of ice that covers the continent—would still expand and contract. The sheet, which is broadly dome-shaped, grows as snow falls upon it; over time, the continuously falling snow compacts, and the sheet expands outward, held in place by rocks and mountain peaks. In most of the world, glaciers grow on mountains and flow down. In Antarctica, they are moving parts of the larger ice sheet. When the ice expands beyond the land, at a point called the grounding line, it starts floating on the sea, becoming an ice shelf. As the ice shelf grows, it meets geologic features, such as islands, and these allow it to push back

against the ice sheet from which it came. The shelf and the sheet help to stabilize each other, like a flying buttress and a cathedral arch.

As far as we understand it, problems start when warm ocean water gets into vulnerable places like Thwaites. The water eats away at the ice by the grounding line. This ice starts to thin and flow outward faster, becoming more fragile. The buttressing effect weakens. The grounded ice sheet loses mass and starts to float, and, gradually, more water enters the bowl. This process, which could potentially become irreversible, is marine-ice-sheet instability.



"In lieu of flowers, please send twenty anchovy pizzas to Glen Rayburn, at 179 Warren Street . . ."
Cartoon by Lars Kenseth

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Eayrs and Holland would be working as part of a team that hoped to use the ship’s helicopters to establish an ice camp on Thwaites. There, they would assemble the hot-water drill, and use it to punch through the glacier, in order to install permanent underwater probes for remote monitoring. The British

Antarctic Survey had led the effort to build the drill, and the Koreans had partnered with British researchers to learn how to assemble and operate it. Meanwhile, other scientists on board the Araon would study the Amundsen Sea's water and microbial life. Glaciologists and geophysicists would fly out to maintain an array of previously planted G.P.S. base stations, some vital to tracking the fast-spreading ice, which can sometimes move as much as five metres per day.

To place our sensors, which would collect data on the warm currents near the grounding line, Greenbaum and I would have to fly farther than any other team, putting us at constant odds with the weather and with our fuel supply. After we'd thrown our sensors into the ice rifts, our helicopter would then have to hover at risky low altitudes, staying within range until the probes had returned their data wirelessly. None of this was going to be easy.

Greenbaum is quiet and trim, and somewhat resembles the actor Daniel Radcliffe. He didn't stir when, during our second night at sea, a stainless-steel coffee cup I'd swiped from the galley clattered across the room. I stood to retrieve it and immediately fell to all fours as the floor lurched to starboard. Through the cabin's porthole, I saw inky waves rising higher than the window, painted in glittering moonlight. I envied Greenbaum his sleep.

The waves worsened the following day. That night, I lay in my rack rigid as a corpse. I tried to read, but my motion-sickness patch had made my vision blurry. My backpack slid across the room, collided with the cabin door, and then slid back.

"Dude," Greenbaum said. "Please don't make me get that."

Greenbaum was used to extreme conditions. Early in his career, he had applied to join *NASA*'s astronaut corps, and had made it to a final round. This was his third sea voyage to Antarctica; he'd taken no seasickness medicine, which seemed superhuman to me. In his rack, he looked ashen.

I pulled the backpack into bed with me and peered through the porthole. The waves now topped thirty feet—great sheets of foamy black brine slapping the upper decks of the ship, rendering them off limits. We were heading toward the Antarctic Circle, where the sun would no longer set. We had six

days of waves ahead of us—ceaseless, violent rolling and pitching, without rhythm or order.

The worst swells subsided as we approached Antarctica and reached the first ice packs of the Amundsen Sea—endless white plains floating on the water, smooth but for occasional penguin prints. The Araon smashed easily through the floes. The ship vibrated with the constant grinding of hull against ice; being belowdecks was like huddling inside a giant blender.

One morning, I brought a cup of coffee to the forecastle. Knots of ice the size of cars now drifted by, alongside the occasional parking-lot-size sheet. I peered over the rail, and a seal sunning on a strip of ice looked up at me. On another stretch of white, penguins flapped their wings in alarm and waddled away. I felt like a colossus, sailing on as though by divine right. But by midmorning fog enveloped us. The cold became otherworldly. I had pictured icebergs as diamonds jutting from the sea, but the ones we encountered were flat slabs a hundred feet high. Their craggy sides loomed above the ship, their upper rims barely visible. Icebreakers are typically built to push through low, flat ice floes. These were mountains in motion.

At home, the climate situation felt desperate, harrowing. It was hard to square that with what I was seeing. Nothing around me felt frail or endangered, though I knew it was; I never heard anyone on the ship talk about the environmental crisis. Beem, Pierce, Stutz—they were not activists but scientists, focussed mainly on the difficult, alluring task of data collection. “My whole attraction to the astronaut corps, for a long time, was the desire for exploration,” Greenbaum once told me. “My interest has shifted to discovery—understanding something for the first time, versus seeing something for the first time.” He wanted to know how the world worked—saving it was almost a by-product.

The icebergs crowded in. On deck, Pierce and Stutz explained that, thanks to cloud cover, satellite images could not offer a clear route through the maze; even when they did indicate a path, it might close while we were travelling through it. The captain, whom none of us had met, had no choice but to push ahead, trusting his instincts about which ways to turn. For centuries, ships had been getting trapped in Antarctic ice; some got crushed, never to be seen again.

“This is real Shackleton shit,” Pierce said.

We were at a junction. To the left, open black sea yawned between icebergs that looked about a quarter mile apart. To the right, a channel between ice blocks was perhaps a hundred yards wide.

“He’s trying to make a call,” Stutz said, of the captain.

“No way he goes for it,” Pierce said.

The engine whined to life and reached a roaring crescendo.

“Whoa,” Pierce said. “He’s going for it.”

The boat turned right, pressing deeper into the labyrinth. Snow flurries came and went; when the sun shone, teal light pulsed from within scars and gashes in the icebergs. At one point, we entered a narrow channel defined on one side by an ice slab that Beem told me was nearly the size of Rhode Island. I didn’t want to think about what might happen if our passageway closed. After coming all this way, I’d grown less afraid of getting stuck in the ice than of not seeing Thwaites.

I took to haunting the deck. On the next morning, the ship veered left, into a tight passage between ice walls. I looked up and, improbably, saw Greenbaum in Oakleys, standing on a catwalk adjacent to the bridge.

“How did you get up there?” I called, over the engines.

“There’s a ladder around back,” he shouted.

I cautiously made my way to him as the Araon rose and fell. High above the deck, Greenbaum looked relaxed, with his hands in his pockets. He seemed at home in the forbidding scene. (On our previous expedition, he’d often taken me for runs on the ice, choosing a direction at random.) We were about a hundred feet up, but the rims of the icebergs still towered over us.

“I’ve never seen anything like this,” I said, stupidly.

"No one has ever seen anything like this," Greenbaum said. It was a Heraclitean thought: no one ever visits the same Antarctica twice.

A day or two later, the engines eased to a simmering growl. The vibrations beneath our boots diminished, then died. A wall of ice blocked our way to the left. Ahead was another wall, smooth as marble. On our right, two gnarled icebergs intersected. There was no obvious way forward. It was January 23rd. We had been at sea for twelve days.

No one said anything. Only the ice spoke, grinding and moaning between sizzles and snaps.

"I could use a drink," I said. "Anybody else?"

Everyone nodded, so I climbed belowdecks to retrieve a bottle of wine from my cabin. I tried to accept the possibility that the ice had trapped us, and that we might not reach Thwaites. Back on deck, Stutz and Pierce were standing with Yalalt Nyamgerel, a Mongolian isotope geochemist from Ewha Womans University, in Seoul, whom I'd often seen writing in her journal. I handed out cups and poured generously.



"I lost my reading glasses, so pick something wordless."
Cartoon by Amy Hwang

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People on the ice often make a toast to Ernest Shackleton. During the heroic age of Antarctic exploration, Shackleton, who was known to his crew as the Boss, failed to reach the South Pole despite several attempts; he survived a doomed expedition on the Endurance—a sunken ship, no way to call for

help—without losing a single man. A well-known paean to him goes, “When things are hopeless and there seems no way out, get down on your knees and pray for Shackleton.”

“To the Boss,” I suggested.

“To the Boss!” everyone replied.

We clinked cups, pondering our situation.

“It’s a good thing we have helicopters,” Pierce said.

The Araon would not reach Thwaites. Neither would another ship we spotted in the maze one morning—a reddish pixel near a distant iceberg.

“That’s the Palmer,” Holland said—the Nathaniel B. Palmer, an American icebreaker, run by the National Science Foundation, which had no aircraft on board. “Drifting aimlessly, nothing to do.”

Pierce was right: we’d made it within helicopter range. Once the clouds lifted, the pilots adopted a round-the-clock schedule, flying scientists and drill supplies to a base camp on the Dotson Ice Shelf, roughly ninety miles from Thwaites and ten minutes from our ship. The drill would be set up there instead, and the Korean engineers would still get the experience they needed to build it at Thwaites the next time around.

Severe weather descended. While we waited for it to lift, the boat sailed around in fog and snow, so that the teams studying seawater could deploy sensors in the Amundsen. When the skies cleared, Beem, Stutz, and Pierce started their work, flying thousands of kilometres in the course of five consecutive days, mapping the glacier down to its grounding line.



"O.K., let's go over it one more time. It's Thanksgiving at my house, Christmas at Little Jimmy's, New Year's at Frankie's, and we're out."
Cartoon by Christopher Weyant

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The helicopters on the Araon were a finite resource. Greenbaum, who sees coalition maintenance as a key part of his job, wanted to make sure that the Koreans got the next turn. (A child of divorce, he attributes his diplomatic habits to his experience managing mom and dad.) He suggested that he go last, giving priority to Lee Choon-ki, a member of the Korean Extreme Geosciences Group, who would fly with other researchers to their G.P.S. stations. Meanwhile, Greenbaum and I started prepping for our journey. “Bring all your survival gear,” John Bishop, our pilot, warned us. Bishop, an aviator with Canadian Helicopters, spoke with seeming certainty that our helicopter, whipped by unpredictable winds, would crash, leaving us on the ice. Greenbaum and I stuffed fur-lined Michelin Man jumpsuits into our backpacks, along with gloves that resembled black oven mitts. From our lockers we pulled immersion suits, which were like wetsuits but more constricting. We’d tried them on before departure; mine was so tight on my upper body and neck that I almost felt as if I were being choked.

Finally, on February 12th, our flight day arrived. Our craft was a compact six-seater. On the ship’s helipad, Bishop gave us a safety briefing. “If the helicopter loses altitude, emergency flotation devices will inflate here and there,” he said, pointing at the skids. He indicated a large red canvas cube in the back: “This is our emergency raft. Only throw it out if I tell you to, or if the helicopter begins to submerge—do not inflate it inside!” He gestured to a

panel of indistinguishable toggle switches near his seat: "This is the emergency beacon. If I am incapacitated, the first thing you should do is flip this switch." I squinted, unsure which was the right one.

In the Army, I'd rappelled from helicopters and leaped from them in parachutes; in Afghanistan, I'd run rotary-wing operations for my task force. But this was my first time in such a small helicopter. I recalled that, in 2013, someone had suffered major injuries when a helicopter crashed and burst into flames on the deck of the Araon, on the very spot where we now stood.

"O.K., load up," Bishop said.

Greenbaum transferred equipment—a rack of radio receivers, a dozen sensors encased in metal shells—while Bishop buckled in and toggled some switches. Soon the stentorian thump of the blades overwhelmed all other sounds. Pressing into the wash of the rotors, I walked around to the pilot's side to turn on a downward-facing camera that would take a photograph of the ice every six seconds. I climbed in, buckled up, and pulled on a noise-cancelling headset. Bishop mumbled some unintelligible helicopter-speak, then took us up as though gravity were merely a suggestion. It would be an hour's flight to the glacier.

Aviation in Antarctica is dangerous in part because there is often little visual difference between ice, water, sky, and mountain. Clouds cast dreamlike reflections on the ice and sea, and pilots can quickly lose their bearings. The sun loomed above us as we flew, and wispy clouds threw pale blue shadows on the ice below, which looked in some places like kneaded dough and in others like dragon scales. Swirls of fine crystals in the cerulean sea looked like cream poured into blue coffee; slush surrounding icebergs was in fact human-height chunks of ice, piled up. We were flying by dead reckoning. "Magnetic compasses are unreliable here," Bishop said, over our headsets. "We're too close to the South Pole."

We listened to the Dixie Chicks as we flew over the cracks and mesa-like formations of the Crosson Ice Shelf. We pushed against the forty-knot wind, the helicopter's movement a slow, prolonged shudder. At last, we reached the edge of Thwaites.

“Be on the lookout for any water or thin ice,” Greenbaum said.

Near a stout, jagged white hill, we spotted an opening that might have been the size of an Olympic swimming pool—it was hard to tell from a hundred and fifty feet in the air.

We positioned ourselves over the hole, and Greenbaum opened the door and dropped a sensor. I activated a software program to begin real-time monitoring of the probe. Greenbaum fiddled with his receivers. Nothing happened. The first drop was a bust.

“Let’s try another one,” he said, uneasily.

We circled around again. “You guys ready?” Bishop asked.

We each gave a thumbs-up. Greenbaum unlatched the door and shoved it open a second time. Freezing wind whipped into the helicopter. He loosened his seat harness and leaned out. In his hands he held the probe—a ten-pound gray torpedo, about three feet long and five inches across. Ignoring the turbulence, he looked down at the target. Could he hit it?

“This is not fuck-around wind,” Bishop said. His voice was pilot-placid, but the helicopter bumped and jolted. “This might not happen.”

Greenbaum leaned even deeper into the rotor wash, drew the torpedo back, and hurled it outward. As it fell, its drogue parachute deployed—crucial for keeping it upright. I activated the software again. Then the probe plunged through the opening and into the sea.

Greenbaum slid the door shut and, as Bishop brought the helicopter into a tight orbit, grabbed his laptop to check for a positive signal. For a few moments, we heard only the chop of the helicopter blades. Then a rack of radio receivers let loose the whistles, screeches, and crashes of a modem handshake. On Greenbaum’s laptop, numbers suddenly sped across the screen. The sensor was plummeting through the water, returning data on salinity, temperature, and depth.

“Jesus, this water is hot!” Greenbaum said.

He began reading off the rising numbers, in Celsius. Three hundred and sixty metres down, the water was almost a degree warmer than at the surface. At nine hundred and ninety metres, the probe hit the seafloor, which turned out to be much deeper than previously estimated; the water there was close to three degrees warmer than at the surface.

“This is what is melting Thwaites!” Greenbaum said. There was triumph in his voice. We had captured data from beneath the Doomsday Glacier.

“We’re done for fuel,” Bishop broke in. “I know you wanted to do more torpedoes, but we have to head back.” Greenbaum smiled, elated, as Bishop pointed the helicopter toward home.

The weather turned bad again. Two days later, on February 14th, Greenbaum, Bishop, and I stood on the bridge with Yun Sukyoung, one of the chief scientists of the expedition, and Dominic O’Rourke, its lanky, easygoing senior pilot. Through the windows, we could see ice and snow whisking across an iceberg. The drill project had been successfully completed, and its hardware and personnel had returned to the ship. Only a week remained until our departure. If Greenbaum wanted to place more than one probe, he needed to fly immediately.

The group pored over space-based reconnaissance maps, wind diagrams, and other reports. O’Rourke held a forecast he’d just received, written in notably purple prose.

“ ‘Quivering winds,’ ” he said, riffing on the report.

“Wrong,” Bishop announced. He stood at the window, surveying a distant peninsula with binoculars.

“ ‘Shivering seas,’ ” O’Rourke added.

“Wrong,” Bishop said again. The weather in Antarctica was changeable. In his view, it was changing in our favor.

O’Rourke, looking at the maps, concurred. “There’s a clearing that way,” he said, pointing. “A little bit of cloud, but we should be able to get a full day.

Tomorrow looks pretty good down there as well." It appeared that we might have a brief window in which to deploy more probes.

Greenbaum and Bishop bent over a map of Thwaites and started sorting through possible waypoints, trying to account for wind resistance and fuel burn. They chose fifteen sites—a bombing run near the glacier's grounding line. To reach the eastern targets, we'd need to stop at an improvised refuelling depot, which the pilots had established a couple of weeks earlier and named Bishop's Knob.

We set out that morning. It took us an hour to reach the depot, which first appeared as a single red point in a featureless plain of white. Bishop landed; the engine grew quiet, and an imposing silence took hold. We were surrounded by Antarctic nothingness.

"You O.K. over there?" Bishop asked me. The flight had been very bumpy, and I had struggled to keep my light breakfast from glazing the interior of the aircraft.

"I'm O.K.," I said, lurching out of the helicopter in my immersion suit and pulling the hood off so quickly that some of my hair came out. I leaned forward with my hands on my knees.

"So, not O.K., eh?" Bishop said. A young Sergeant Brown would've been disgusted by middle-aged me. "This is a good place to throw up, if you're gonna," Bishop went on. He pointed to the helicopter. "But not in there."

The nausea passed, and I looked around. A fluttering scrap of sun-faded fabric tied to a bamboo stake marked the depot site. Gloomy Mt. Murray pierced the sky to the southwest. Seven red jet-fuel drums lay on their sides, half-buried. It took Bishop and me fifteen minutes to dig one out with our gloved hands. He ran a hose between the barrel and the helicopter and began refuelling. Then we resumed our trip.

Toby Keith sang through our headsets: "I should've been a cowboy / I should've learned to rope and ride." Below us, mile-long lacerations in the ice gave way to ever-larger gashes, as though some gargantuan creature had slashed into the ground with its claws. Eventually, we arrived at what

glaciologists call “the mélange.” There, the ice was crushed, geometric, with slabs surrounded by slush. Icebergs trapped by frozen ocean had piled up, and flat features the size of stadiums jutted from the landscape. Grounded ice was sliding into the sea, creating a chaos of lumpy alabaster mountains, valleys, canyons, foothills, and ice-sealed lakes. There were cliffs and outcroppings, chasms with shimmering blue interiors. It was a science-fiction wasteland, alien and appalling.

We hunted for openings that revealed the water, but spotted only areas where inch-thick ice covered tiny cracks a couple of feet across. Bishop headed toward one of them, descending into a narrow alleyway.

“Can we go lower?” Greenbaum asked.

“Yes, but I can’t hover there for too long,” Bishop said. “Keep an eye on the tail rotor.”

He eased us down to about ten feet above the ice. I craned around to look: walls were encroaching on either side. I pulled open the door. Greenbaum leaned out to drop the torpedo. He squinted, aimed, and threw; the probe cracked the ice and descended into the water before its drogue chute could deploy.

We flew on. Bishop developed a clever technique, hovering over our targets and allowing the rotor wash to reveal the thinnest patches of ice. As we moved from drop to drop, I watched our supply of probes dwindle. They were ingeniously designed: when the devices were submerged, salt water completed an internal circuit, releasing the sensor, which plummeted downward. Meanwhile, a buoy bobbed to the surface. The sensor and the buoy were connected by a thousand-metre-long wire. The sensor used the wire to relay its findings to the buoy, which then transmitted the data to radio receivers on the helicopter.

We deployed eleven probes, with a mounting sense of exhilaration. But then Greenbaum frowned. He turned to the instrument rack and adjusted a few knobs. He looked with alarm at his laptop screen.

“Something is wrong,” he said.

When Greenbaum confronts a difficult problem, he retreats inside himself to concentrate. He spent the rest of the flight in silence. It was only back on the ship, at a makeshift desk in our cabin, that he realized what might have happened. He pointed to a graph on his computer. “This shouldn’t look like that,” he said. “I think it’s the ice. While the probe is falling deeper into the water, the buoy is supposed to float on the surface. But on some of the drops the ice was so thick that the probe could only punch a six-inch hole. When the buoy floats to the top, it hits ice instead of open water.”

I saw the problem: I imagined a man falling through ice covering a lake, then finding himself trapped as he swam toward the surface.

Greenbaum sighed, then leaned back, his face fallen. “I think the ice may have distorted the data,” he said. The flight had been a failure.

The weather forecast for the next day was ambiguous. There was a chance that we could fly again and drop more probes. But we needed to solve the ice problem first—otherwise, we’d be dropping them for nothing.

Field geophysics is not a genteel science. You are more likely to reach for a screwdriver or a drill than for a microscope or a flask. In Antarctica, grit and muck get into your hands, which are cracked by the cold; you carry heavy equipment and turn wrenches to tighten ratchet straps around splintered wooden shipping containers. You are as far from civilization as it’s possible to get, and you must figure things out for yourself.

David Holland, the mathematician, had an idea. On expeditions to Greenland, he’d used a cable to lower sensors into the water from the side of a helicopter; the helicopter then hovered, stationary, until the probes had returned their data. Greenbaum thought we might be able to learn from this approach. If we could find a way to break bigger holes in the ice, we could lower our sensors and buoys into them, on ropes. Holland had used large rocks as icebreakers; we had none on hand, and no way to carry them safely in our helicopter. But, Greenbaum suggested, we could remove the sensors from their torpedo casings, and then fill the empty casings with bottles of water. The torpedoes we’d dropped earlier had used drogue chutes to stay upright—but if Greenbaum hurled the modified casings onto the ice lengthwise, they would make much bigger holes.

The first step was to refashion our torpedoes. We'd brought a few types with us: the cheapest batch had fewer features but a heavy black torpedo tube, while the more expensive ones had lighter, thinner shells but superior sensors. We could break the ice with the black torpedoes, then deploy ropes to lower the fancy sensors into the holes.

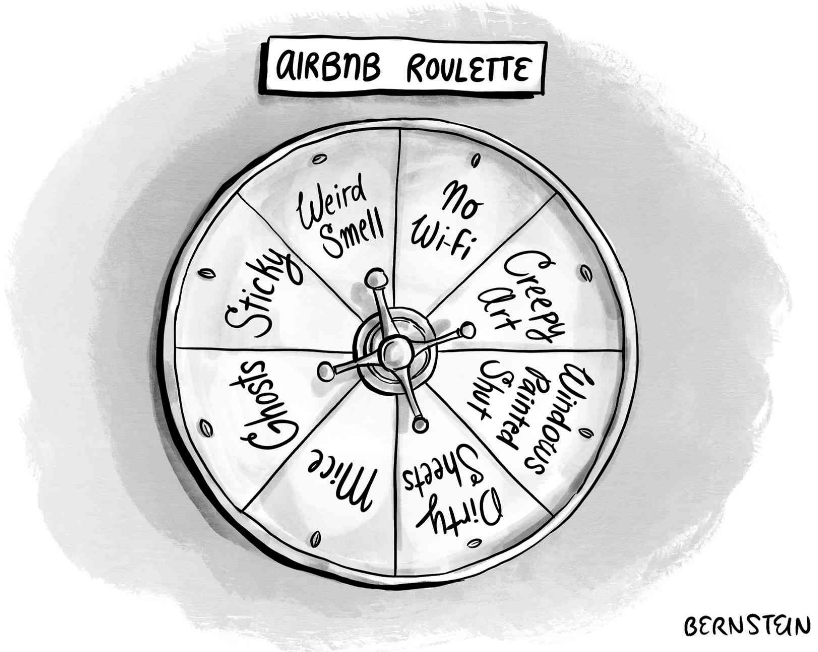
On the main deck of the ship, in a laboratory filled with grimy camp gear, Greenbaum and I sat at a workbench with a black torpedo in front of us. We needed to open the casing. But we were brought up short by a note printed on the torpedo's side:

> WARNING
> DO NOT DISASSEMBLE SONOBUOY
> Potentially hazardous material contained herein.
> Unauthorized handling of the sonobuoy may cause personal injury.
> In case of any damage to the sonobuoy, do not handle.
> Call explosive ordnance disposal team.

The last line gave us particular pause. If opening the probe required calling the same people who disarm mines, it was obviously unwise to do so by ourselves, on an isolated boat in the Southern Ocean. We weren't sure how the torpedoes worked. Was there a small internal explosive charge that detonated on impact, blasting open the casing? While in Antarctica, the Araon had only the sketchiest communications capabilities; with no Internet access, we couldn't even Google.

We started disassembling the torpedo, removing only the parts we knew wouldn't explode and joking nervously about blowing holes in the ship and ourselves.

By giving others first dibs on the helicopters, Greenbaum had earned substantial good will on board. Lots of people, on many different teams and from many different countries, had heard about his predicament and wanted him to succeed. An engineer named Scott Polfrey ambled in. He was part of the British Antarctic Survey, and had helped with the drill. He finished off a can of Cass beer, then set it down on the workbench, next to a pile of empty coffee cups and ice-cream wrappers.

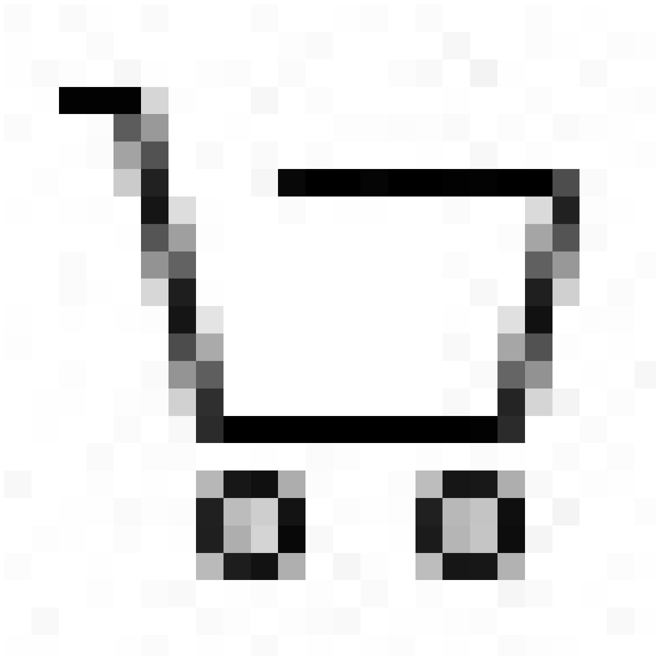


Cartoon by Emily Bernstein

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“You mind?” he asked. He picked up the torpedo, turning it this way and that with alarming nonchalance as Greenbaum described our uncertainties. Polfrey didn’t think the device would explode. “If this had an explosive,” he said, “it would proba— Well, it does say ‘explosive’ on it, I’ll give you that.” But, he argued, maybe the “explosive” was just a cartridge of carbon dioxide, and wouldn’t be that bad: “It’s only going to detonate if you put it in water.”

He laid the torpedo on the floor. He reached for a heavy-duty flathead screwdriver and locked eyes with Greenbaum.

“Do you trust me, Jamin?” he asked.

“Of cou—” Greenbaum said.

Polfrey stabbed the screwdriver into the possibly explosive part of the torpedo and pried as hard as he could. The sensor slid out, sans explosion. We all backed away.

“Just go a bit steady with it, in case it does anything,” Polfrey said. He nodded, satisfied.

Now we could see what an actual sensor looked like. It was about the size of a magnum bottle. We were excited—it would be easy to tie the sensor to some rope.

Greenbaum went to find Bishop to tell him about our plan to lower the sensors by hand.

“No,” Bishop said, the moment he heard it. “No way in hell.”

Safety was his priority. Hanging loose rope from a helicopter, he warned, was like playing Russian roulette. If the wind whipped the wrong way, or someone slipped, or the probe hit a skid and bounced up, the rope could be sucked into one of the rotors, and everyone could die.

“We’ll figure something out, Jamin,” Polfrey said.

We needed to maintain control of the rope, the way mountain climbers do when they lift and lower gear and people. We had plenty of rope—we were on a ship, after all—but didn’t know how to arrange it. Pierce, who’d volunteered in mountain rescue, heard about our dilemma. He picked up an extracted sensor and wrapped a piece of rope around it, tying an elegant knot. He then demonstrated how the sensor could be controlled using a rope bag, which could keep the rope neat and contained.

We showed the setup to Bishop, who balked. It was clear that he wanted something more robustly engineered.

Polfrey and I headed to one of the seawater labs and began rummaging through unlabelled black plastic bins, which held supplies. We wanted to find something we could wrap the rope around, so that none of it was loose—in other words, a pulley. In one bin, we uncovered a stack of aluminum pipes that the Extreme Geosciences Group had used for their G.P.S. stations. We consulted Lee Choon-ki, who told us to help ourselves. From another bin, Polfrey extracted a hacksaw and a file. He started sawing the pipe. We took turns cutting it into ten-inch lengths. We could wrap the rope around and around the pipe, creating a spool, and then run another rope through the pipe’s hollow interior, which would secure the pulley to Greenbaum’s

harness. We had enough pipe to make an individual pulley for each sensor, for maximum organization and safety.

We presented our handiwork to Bishop, who eyed it skeptically. We explained exactly why the system was safe. We pulled the rope this way and that, proving that it would always be in our control.

“O.K.,” Bishop said at last. “It’s fucking perfect.”

The idea of stuffing the casings with water bottles had never sat well with Greenbaum. “We really didn’t come all this way to throw plastic in the water,” he told Yun Sukyoung. “We want something environmentally friendly. Something dense and heavy.”

“I have something,” Yun said. She disappeared into the ship and returned a few minutes later carrying a pair of large iron shackles. If the ship had made it to Thwaites, she would have used them to connect special sensors to a seafloor anchor. We weighed them in our hands.

“How many do you have?” Greenbaum asked.

“As many as you need,” she said.

Yalalt Nyamgerel, the geochemist from Mongolia, arrived to help take apart the torpedoes. We filled the tubes with linked-together shackles, which we bolted to the tube interiors. I picked up one of the completed assemblies. It weighed around thirty pounds—heavy enough to smash a big hole in the ice. I set it down on the deck with a thud.

Holland walked into the room.

“This is the bomb,” I said. “It’s filled with shackles.”

We named our creation the Shackleton Bomb.

Night was indistinguishable from day. Still, we had worked around the clock, and skids-up was fast approaching. It was with a sense of desperation that I realized I couldn’t handle another nauseating flight over the end of the

world. The mission needed to succeed; the probes needed to reach their targets; a great deal was at stake. Holland took my place.

I watched from the deck as the helicopter spun up. I walked into the rotor wash, started the camera mounted to the side, and stepped away. Bishop took the aircraft up. In an instant, it was gone.

I stood in the silence. Eventually, I heard the songs of some snow petrels that were swooping around a familiar iceberg behind the ship. It was a massive ice mountain that, in its profile, evoked El Capitan. For days, a house-size hunk of ice at its peak had been threatening to collapse; each night, Beem, Pierce, Stutz, and I had watched it, waiting with cups of whiskey, beer, or wine. We wanted to be there when it fell. We imagined the tortured crack and the cataclysmic splash of its impact. Like everything else in Antarctica, it was doomed on its own timescale, yet seemed ancient and eternal.

Around four hours later, the helicopter returned. I looked through the windscreen, where Bishop, his face calm, flipped switches to power down. To his right, Holland was gathering gear. A side door opened, and Greenbaum climbed down. He looked up, saw me, and offered a triumphant thumbs-up.

“Dude!” he said. “It worked. We got it.”

Climate scientists often feel a mixture of pride and foreboding. Pride because they can shed light on our collective future; foreboding because it’s a future they fear. There will be years of analysis ahead—papers to write, models to improve—and there will be more data to collect. But we may soon know whether Thwaites has fifty, a hundred, or five hundred years left.

I thought about the glacier’s fate during the trip home, tossed by twenty-foot waves. Outside my porthole, the sea was heaving and subsiding, unstoppable; we’ve made our choices, and now it will decide how much our continents will shrink, and when. Exhausted and seasick, I felt the ocean’s obliviousness to us. All the more reason to attend to it. ♦

By Evan Osnos

By Ted Geltner

By Bill McKibben

By David Remnick

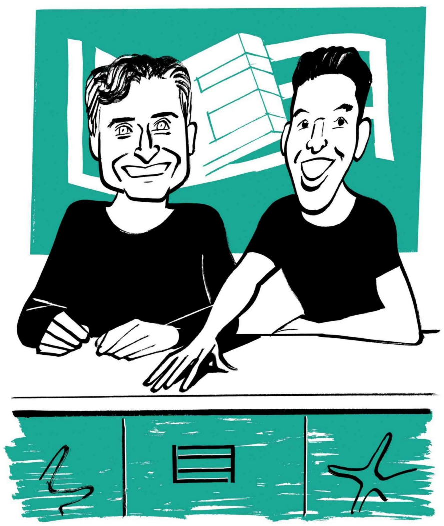
News Hole

- **Live from the Brooklyn Museum—Today's Top Stories!**

Live from the Brooklyn Museum—Today's Top Stories!

Instead of making art, an artists' collective has turned its attention to making news, broadcasting from its own news desk about Vladimir Putin, mass incarceration, and sexual harassment.

By Adam Iscoe



Most people don't trust the news anymore, but everyone still seems to want a piece of it. Hedge funds are scooping up TV stations. Billionaires are buying newspapers and tech platforms. A few hours before Elon Musk finalized a deal to purchase Twitter, last month, a super *PAC* turned artists' collective launched a news network in the lobby of the Brooklyn Museum. (Mission statement: "News for creative emancipation. This is journalism made by the people making culture.") "I love things like 'The Daily Show' and Ali G, but we're trying to actually make news, and *be* the news," Eric Gottesman, an artist who is co-directing the project, said. He co-founded the collective, which is called For Freedoms. Its news program is more pastiche than parody: "We're appropriating the form and aesthetic of broadcast news as a way to build greater civic engagement through art." He added, "And we have a news desk!"

At 8 *A.M.*, a group of gaffers, grips, lighting technicians, and caterers arrived to set up. Massive batteries were rolled into place; cameras, microphones, and stage lights were arranged.

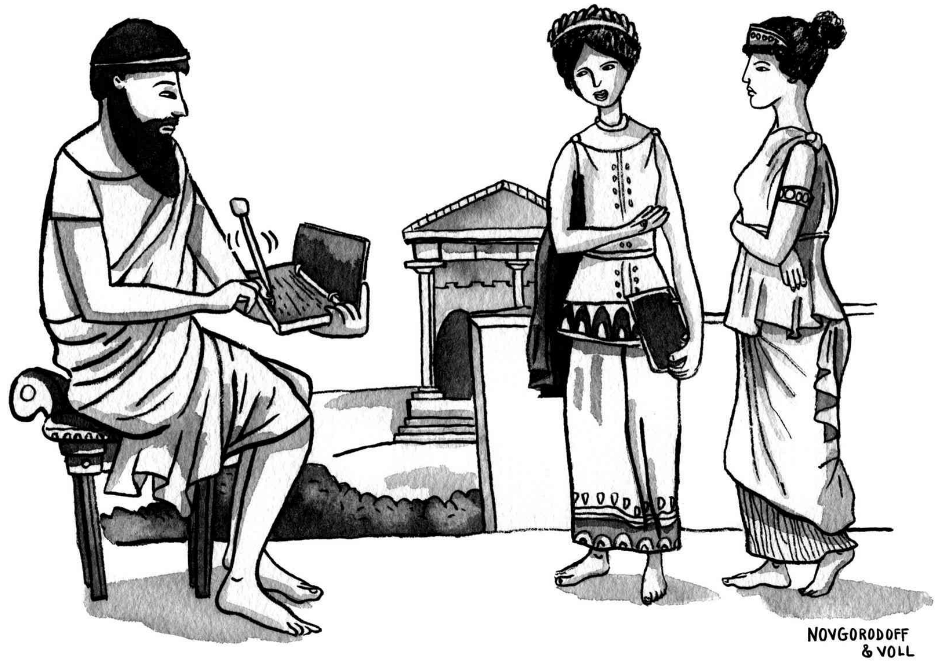
An artist named Christina Caputo, one of the producers, arrived at ten. "I don't necessarily call myself an artist," she said. Caputo led the crew in a "grounding session." "Let's take a moment and appreciate each other," she said. "There are gonna be moments when there are challenges, and there are gonna be moments when we love each other." Inhale, exhale; the crew was restless. "Excuse me, where should we place the monitor?" a technician whispered to Gottesman. Soon the news desk, designed by the artist Harry Chadha and accented with purple starfish, was assembled; someone had accidentally printed part of the collective's logo upside down.

Gottesman didn't mind, he said, looking up at a huge canvas by Cecily Brown that was hanging above the newsroom. "We had to make sure that none of the lights would melt the painting," he added. He was eating a roasted-vegetable sandwich, and his mouth was smeared with mustard. "This is both an installation and a site of capture," he said.

A few crew members sat behind the news desk, joking around. "We need some diversity onscreen," a Black key grip named Che Roacher said. As a camera test, he decided to give an impromptu monologue: "They own everything. It's fucking impossible. This country is owned by the powerful and rich. It's been that way forever." Some of the artists had gathered near the monitors, holding ginger-lemon probiotic sodas, to watch.

For Freedoms was started in 2016 as an antipartisan super *PAC*; since then, the group has worked with more than a thousand artists, including Carrie Mae Weems, Ai Weiwei, Marilyn Minter, and David Byrne, on civic-minded art projects. In one, a flag designed by the artist Dread Scott, reading "A Man Was Lynched by Police Yesterday," was hung outside a gallery. Another placed more than five hundred artist-designed political billboards across all fifty states. The news program would feature dozens of artists doing broadcasts streamed online: Duke Riley giving a woman named Sandy a Hurricane Sandy-inspired tattoo, to mark the storm's tenth anniversary; a monologue on intimate-partner violence and houseplants, delivered by Tanya Selvaratnam, one of three women who, in 2016, accused Eric

Schneiderman, New York’s attorney general at the time, of abusing them. “I like plants more than people,” she said.

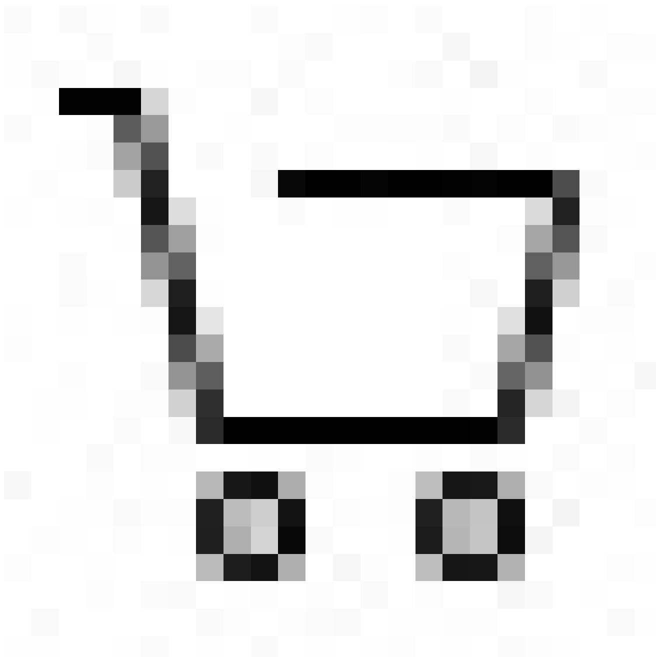


“I’m his muse, which he says is even better than co-author.”
Cartoon by Danica Novgorodoff and Michael Voll

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A few grips and gaffers appraised the catered lunch (a salad of greens grown in a vacant city lot) and headed out to get some Chinese. “That rabbit food is not cutting it,” one said. Gottesman sat behind the news desk with an artist named Robert Sinclair, who would be one of the hosts. In the coming days, more serious subjects (mass incarceration, the sexual harassment of Black women, Vladimir Putin) would be discussed by more serious guests—formerly incarcerated artists, exiled Iranian artists, a teen-age transgender artist who has sold millions of dollars’ worth of N.F.T.s—but the setup day was for having fun. “There has to be space for play in order for us to be creative, to rethink some of these big things,” Gottesman said. “If we really are going to profoundly shift the foundations of the structures of society through culture, it’s got to be playing with it, poking at it, experimenting with it, failing, and laughing.”

Lights, camera, playtime! Sinclair summoned his best anchorman voice: “We’re exploring the weather at the Brooklyn Museum with Eric Gottesman. Eric, what’s the weather like—”

“At the museum?”

“Inside your head!” Sinclair said.

A grip in a pink hoodie watched them. “They’re full of shit,” he said. “Some of them gonna talk about what they know, but what they know is what they regurgitate from hearing it on the news.” ♦

An earlier version of this article misspelled the artist Dread Scott’s name.

By John Cassidy

By Kyle Chayka

By Kyle Chayka

By John Cassidy

Poems

- **“The Old Painter on a Walk”**
- **“To the Realization of Perfect Helplessness”**

By Adam Zagajewski

Audio: *Read by the translator.*

In his pockets treats for local dogs
He sees almost nothing now
He almost doesn’t notice trees suburban villas
He knows every stone here
I painted it all tried to paint my thoughts
And caught so little
The world still grows it grows relentlessly
And yet there is always less of it

(Translated, from the Polish, by Clare Cavanagh.)

This is drawn from “True Life.”

By Joshua Rothman

By The New Yorker

By Lauren Collins

By Nicole Rose Whitaker

By Lauren Michele Jackson

By Richard Brody

By Richard Brody

By Thomas Beller

Portfolio

- **The Blade Runners Powering a Wind Farm**

By Ted Geltner

By Jill Lepore

By Patricia Marx

By John Cassidy

Tables for Two

- **The Best Shrimp Cocktail, at Kingfisher**

By Hannah Goldfield

You might describe my relationship with shrimp cocktail as delusional. If it's on a menu, I order it. It's almost always unexceptional, and yet I'm compelled by its raw-bar glamour, and by the slimmest chance of greatness. One night in the summer of 2021, this high-stakes calculation paid off like never before. I ordered shrimp cocktail at, of all places, a breakfast-taco window, called Mockingbird, briefly home to a pop-up oyster bar. It was the best iteration I'd ever had—the sweetness of the plump, chilled meat drawn out with salt (why is shrimp cocktail so often undersalted?) and lemon zest (a revelation), served with shaved horseradish and a fruity but balanced cocktail sauce.

I'm delighted to report that the shrimp cocktail of my dreams has signed a lease. Last month, in Prospect Lefferts Gardens, André Hueston Mack and Phoebe Damrosch, a married couple who met working at Per Se (he was a sommelier, she a server), opened Kingfisher. It's the latest addition to their growing neighborhood empire, which, along with Mockingbird, also includes & Sons Ham Bar and Buttery, a restaurant and shop specializing in domestic cured meats and cheeses; a wine store called VyneYard (Mack has his own label); and a bakery called Chickadee Bread.

If there's a through line to these diverse businesses, it's Mack's obsession with highly specialized kitchen machinery. His interest in cured meats arose partly from his first big purchase: a meat slicer manufactured in 1910. A Texas native, he got serious about making breakfast tacos only after he bought a top-of-the-line industrial tortilla press. In the spring of 2020, he woke up after an evening of drinking and said to Damrosch, "I think I bought a flour mill last night." Indeed, he had: custom granite, made to order in Vermont, now in use at Chickadee.



Clockwise from left: fluke with pickled butternut squash, yuzu kosho, and pepitas; hiramasa, a type of yellowtail, with Asian pear, XO sauce, and shiso; monkfish with potato purée, poached potato, herb purée, and herb salad.

& Sons Hospitality Group's culinary director, Nico Bouter, who was the chef de cuisine at Ignacio Mattos's Flora Bar, can more than handle it all. At the Buttery, he devised a menu of simple but inspired sandwiches. (A standout features soft-boiled heirloom egg, anchovies, and pesto on sourdough.) Born in the Netherlands, he took to tacos with ease, overseeing the daily pressing of Mockingbird's superlative flour tortillas, which get filled with house-made chorizo and scrambled heirloom eggs, or Rancho Gordo black beans and Grafton Cheddar.

Kingfisher could be loosely categorized as a seafood restaurant, but "our concept was 'Let's just cook,' " Mack told me recently. It was time to let Bouter flex his chops: "I mean, this guy—I'm asking him to make sandwiches!" In a kitchen that's only slightly better equipped than the hot-plate setups at & Sons and Mockingbird, Bouter displays a nimble efficiency. The eggs that he uses at the Buttery and at Mockingbird—from Ameraucana chickens, a breed that produces beautiful blue shells and vibrant orange yolks—are here, too: in hollandaise, he tosses coins of fingerling potato, crunchy croutons made from stale Chickadee loaves, glossy trout roe, and tobiko, then crowns the intoxicating combination with two medium-boiled halves, egg on egg on egg on egg. Another dish exalts the potato: crushed kettle chips are folded into an earthy fingerling purée and

topped with poached Purple Majesties, on a plate that also incorporates an emerald-hued herb purée, a dill-prominent herb salad, and tender medallions of monkfish loin.

The shrimp cocktail was as good as I remembered. Slabs of raw hiramasa, a type of yellowtail, brilliantly layered with XO sauce, Asian pear, and shiso leaves, gave me a similar thrill, and I was emboldened to break my ban on fluke crudo, a dish that's inexplicably omnipresent, and often phoned in, at upmarket restaurants of late. Satiny morsels of the mellow white fish were dressed with yuzu kosho, toasted pepitas, and raw cubes of pickled butternut squash, gone al dente in their brine—a sensationally bright, zippy, and textured composition that somehow also read as gentle and creamy, the familiar turned fresh. *(Dishes $6-$36.)* ♦

By Nick Paumgarten

By Wren Chavers

By Nicholas Dawidoff

By Naomi Fry

The Current Cinema

- [The Unlikable Souls of “Glass Onion”]

By Anthony Lane

The big difference between "Knives Out" (2019) and its sequel, "Glass Onion: A Knives Out Mystery," is one of climate change. In many respects, the two movies are twins. Both are directed by Rian Johnson; both star Daniel Craig as Benoit Blanc, the sybaritic sleuth; and both present Blanc with a puzzle to solve. The first film was centered on a Massachusetts mansion, amid the rustle of autumn leaves, whereas the new one largely unfolds on a Greek island, in charring heat. The downside is a lack of shadows—a bummer for anyone who believes that murder is most foul, and most gratifying, when draped in gloom. The upside is that we get to see Craig, who rose from the waves like a dripping god in "Casino Royale" (2006), step gingerly into a swimming pool wearing a two-piece bathing costume, in striped seersucker, that even the shyest Victorian gent would have deemed too modest by half. Oh, and a buttercup-yellow cravat, knotted and spotted. Nice.

Nattier still is the scene in which Blanc lounges in his bath, crowned with a tasselled smoking cap, sucking on a cigar, and bored out of his giant mind. "I need a great case," he says. And here it comes. He is summoned to the island in the sun; other invitations, each cached within a cunning box, are sent to his fellow-guests. From the top: Duke (Dave Bautista), who has found fame, if you can call it that, on YouTube, and his inamorata, Whiskey (Madelyn Cline); Claire (Kathryn Hahn), the flustered governor of Connecticut; Birdie (Kate Hudson), once a model, now an entrepreneur, always a fool, plus her assistant, Peg (Jessica Henwick); a scientist named Lionel (Leslie Odom, Jr.); and, to general consternation, Cassandra Brand (Janelle Monáe). Their host is Miles Bron (Edward Norton), a reclusive billionaire who used to be Cassandra's business partner before casting her adrift. Reputedly, Miles is a master of new technologies. Demonstrably, he is a dick.

The opening twist, in the pretzel of a plot, is that Miles lures these folk to his domain and dares them to unpick "the mystery of my murder." One obvious model here is Agatha Christie's "A Murder Is Announced," published in 1950. In both instances, an apparently lighthearted game morphs into a crime with no heart at all; those familiar with the book, indeed, will have a head start in identifying the slayer in the film. Where Johnson scores over

Christie is in the whiplash of his storytelling. We get flashbacks, switchbacks, a darting shoal of red herrings, and scenes whose meaning is upended when viewed from another angle, with fresh information at our command. As Whiskey pours herself all over Miles, say, does she know that Duke is watching through the window? Does he know if she knows?

The title swings two ways. First, toward a track on the White Album, in which fans who read too much into Beatles lyrics are waggishly ribbed by John Lennon. “The walrus was Paul,” he sings. Only by such obsessive detail-sniffing, of course, can you hope to decode a movie like this one. Second, there is an actual glass onion: a stately dome, sitting atop Miles’s island lair, and a telling symbol, I would say, for this extravagant but none too sturdy film. It is shiny with mischief, crafted with guile, and performed with eager wit—not least by Kate Hudson, who turns the tweeting Birdie into the empress of faux pas. (On “Oprah,” we learn, Birdie compared herself to Harriet Tubman; she also thinks that sweatshops are where sweatpants are made.) Why, then, should the whole enterprise feel so curiously thin and cold to the touch?

The clue lies in Agatha Christie. Her gang of suspects, in “A Murder Is Announced,” was a mixture of young and old—as it was in “Knives Out,” which was thoroughly warmed by the friendship, fond and non-creepy, between an elderly author (Christopher Plummer) and his nurse (Ana de Armas). No such good will exists in “Glass Onion,” which is stiff with unlikable souls, all of them Miles’s pals, and thus of the same generation. Frankly, who cares who assassinates whom? Also, in the novel, as Miss Marple observes, “nobody *knows* any more who anyone is.” In the messy wake of war, one could forge not only a new identity but a fictitious past. That covering of tracks isn’t so easy in the digital age, and you can sense Johnson bending the evidence to fit the tale. At one point, somebody is killed before he or she can share a fact that just popped up on Google Alerts. What a way to go.

As for the climax, I will reveal only that it involves major mayhem. In line with“Parasite” (2019) and this year’s “Triangle of Sadness,” “Glass Onion” is bent on smashing the wealthy, together with all their toys—which, coming from a star-stuffed Hollywood spectacle, on a plump budget, strikes me as a bit rich. I wonder what Daniel Craig makes of it all. He clearly relishes the

languid brain work, and savors the character of Blanc as if it were ripe Brie, yet here he is, with everything exploding in fireballs. Isn't that what he was running away from, when he fled the world of Bond?

Tall and black-gowned, with a paunch and a pair of blue-tinted spectacles, Jack Gladney (Adam Driver) is the chairman—and the proud founder—of the department of Hitler studies at the College-on-the-Hill, a pleasant cradle of learning. And here's the fun part: Jack doesn't speak German. He tries, but he just can't get his all-engulfing American mouth around the Teutonic tongue. This frustrated figure, inclined to be hopeful yet pestered by intimations of doom, and brought to life by the tireless Driver, is the hero of "White Noise," written and directed by Noah Baumbach.

The movie is based on Don DeLillo's novel of the same name, from 1984, and is set in that decade. (Hands up: who is instinctively on the side of any film that is smartphone free?) As so often with Baumbach, we are ushered into the bosom of a family. This bosom is busier than most, because Jack and his wife, Babette (Greta Gerwig), not only have a child of their own but also house kids from their previous marriages; two of the siblings, Steffie and Heinrich, are played by a real-life sister and brother, May and Sam Nivola, thus adding to the lived-in domestic texture of the story. If, like me, you enjoy watching smoothly choreographed sequences of people weaving in and out of rooms, chattering and snacking, or rallying one another to the TV ("Hurry up, plane-crash footage!"), then the everyday crackle and hum of "White Noise" will be enough.

But this is DeLillo, so we must brace ourselves for narratives—or, at any rate, for occurrences that are so dense with the gaseous air of conspiracy that you can barely breathe. Hence the pills that Babette takes, in secret, or the "Airborne Toxic Event" that shrouds the landscape and causes the townsfolk, including the Gladneys, to evacuate. Baumbach, too, is taking flight, away from his regular zones of operation and into Spielberg country, where the highways seize up in mass panic, beneath a storm cloud as loomingly vast as a spaceship. And, all the while, everyone converses in fluent DeLillo: "Maybe there's no death as we know it, just documents changing hands." What husband has ever said that to his wife? On the page, the fact that the characters sound like the author somehow deepens the ominous charm of the spell that he casts. Onscreen, it's too weird for words.

Nevertheless, even if you grow impatient with "White Noise"—an intimate black comedy that dreams of becoming an epic—stick with it, for the sake of the end credits. Unfolding in wide shot, against the background of a seething supermarket, like an Andreas Gursky photograph, these are a miniature masterpiece unto themselves. Given the chance, Baumbach can't help making a song and dance of things. Someone please put him in charge of a musical, and soon.

There is more than one son in "The Son." The first son we see, at the start of Florian Zeller's new film, is a baby named Theo. He is doted upon by his mother, Beth (Vanessa Kirby), and his father, Peter (Hugh Jackman), who live comfortably in New York. Discomfort arrives at the door, in the shape of the anxiety-shredded Kate (Laura Dern). She is Peter's ex-wife, and she brings news of *their* son, Nicholas (Zen McGrath), who is seventeen. "He scares me, O.K.?" Kate says.

Nicholas is hardly the spawn of Satan. He seems a mild and dreamy boy; his gaze is misted over, as if his mind were drifting elsewhere, and it's no surprise to learn that he has been skipping school. What did he do all day? "I walked." And what's his problem? "It's life. It's weighing me down." The simplicity of these replies exasperates his father, a lawyer with political ambitions. (Not that the film is remotely interested in work; it's merely an arena for private pain.) Peter's response to the revelation that Nicholas has been self-harming is typical. "I forbid you to do this," he says. That should do the trick.

Nicholas, who has hitherto lived with Kate, moves in with Peter and Beth, and appears—though only appears—to be on the mend. He is loved by those around him, and yet, as a doctor says, "Love will not be enough." Advice that chills the heart. Many viewers, with experience of mental-health crises in their own homes, may decide that the plot of this movie cuts all too close to the bone. (Few of them will be wealthy professional New Yorkers with ready access to psychiatric care.) If "The Son" lacks the grip of Zeller's previous film, "The Father" (2020), it's because the fable of Nicholas and Peter has the brittle feel of a setup. Over and over, as situations are constructed, you can spot the payoff coming; when Peter dances with Beth, in their apartment, do we get a shot of Nicholas looking on, shut out from others' pleasure? Check. Likewise, the finale relies on a detail that's been

planted, with maximum implausibility, a while before. The shock is blunted on impact.

This is not to scorn the skill of the actors, and Dern is on especially wrenching form. It is neither fair nor wise, however, to land Jackman with a role of ceaseless anguish, which, dancing aside, siphons off his natural geniality. The irony is that “The Son” is unceremoniously stolen by Anthony Hopkins, who won an Oscar as a man felled by dementia in “The Father.” He now plays Peter’s father, a power-monger with his wits intact and blazing, who, in a single scene, proceeds to torch the fragile emotional sympathies on which the whole film depends. His recommended cure for the suffering of his son and his grandson is as follows: “Just fucking get over it.” Is that not a monstrous thing to say? It is. Does the monster stay in your head, as the rest of the movie recedes? Completely. ♦

By Isaac Chotiner

By Richard Brody

By Helen Shaw

By Richard Brody

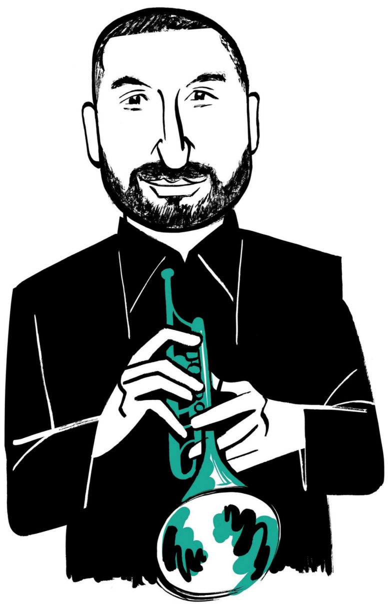
The Musical Life

- **The Four-Valve Trumpeter Who Uses Sharon Stone and Charlie Chaplin to Make Jazz**

The Four-Valve Trumpeter Who Uses Sharon Stone and Charlie Chaplin to Make Jazz

Ibrahim Maalouf, the Lebanese French horn player known for some daring collaborations, visits the Met to check out a display of rare instruments and discuss his own musical unorthodoxies.

By Bruce Handy



A trombone with six valves? "I don't know if anyone played this *ever*," the Lebanese French trumpeter Ibrahim Maalouf said the other day at the Met, where he was taking in a display of extravagant, even bizarre, brass instruments. Maalouf, who is forty-two, lives in Paris and was in town for a concert. He had been curious about the museum's horn collection, which includes not just the six-valve trombone—most have none—but also a vaguely bassoon-like thing (an ophicleide!) with a bell decorated to look like a dragon's mouth, and a tuba with two bells that resemble conjoined twins. In Maalouf's view, much of what was on display—arcane, intestinal-looking contrivances of coiled brass—was more a tribute to the metalworker's craft than anything a working musician might want to play.

Not that Maalouf is a fussy traditionalist. His own preferred instrument is a unique trumpet with four valves (one more than the usual three), which allows him to play the quarter tones of classical Arabic music. He studied European classical music at the Conservatoire de Paris, but made his name playing jazz. He has since embraced electronic music, R. & B., hip-hop, Arabic pop, and other styles, collaborating with such musicians as Wynton Marsalis, Sting, Angélique Kidjo, Juliette Gréco, Josh Groban, and the Kronos Quartet. He's a superstar in Europe, where he regularly sells out arenas; in American instrumentalist terms, he might be placed on a continuum between Kenny G and Jon Batiste, closer to the former in fame and to the latter in style and critical respect. At the Met, dressed in black, with a groomed beard, he could have passed for Rainer Werner Fassbinder's better-adjusted kid brother.

Maalouf's father, Nassim Maalouf, a renowned soloist in both European and Arabic classical music, invented the four-valve trumpet that both men play. Ibrahim grew up listening to his father practice. One day, he asked if he could try. "My father said, 'If you want me to teach you, you *will* be a trumpet player.' I was seven. I didn't know what that commitment meant." He quickly showed promise, but there were bumps along the way. For one thing, if you live with your trumpet teacher, you can't cheat on practicing.

"He gave me lessons every day, until I was fourteen or fifteen," Maalouf recalled. Home life was otherwise hard. He was born in Beirut in 1980, but the family soon fled Lebanon's violence for France; the loss and the upheaval, he said, affected his parents deeply. Nassim was a very strict father. "The only moments he was really soft were when I was taking trumpet lessons," Maalouf said. He laughed. "Maybe that's why I kept playing."

In a sad turn of family melodrama at least as old as "The Jazz Singer," Maalouf's embrace of more modern and popular music contributed to an estrangement between father and son. For Nassim, who had no formal education outside of music, the trumpet had been a way out of rural poverty. "It was his tool to escape his destiny," Maalouf said. "And he expected I would exactly continue his way of playing." Today, they exchange only the occasional text. "We disagree on pretty much everything."

Maalouf's latest album, "Capacity to Love," his seventeenth—not including the many French film scores he has composed, plus a couple of symphonies—may push his father even farther away. Overtly polemical, it is meant as a musical riposte to the right-wing nationalism gripping Europe and other places around the world. Maalouf enlisted a diverse array of collaborators, including the rappers Pos (of De La Soul) and Erick the Architect; the jazz singer Gregory Porter; musicians from South America and Africa; and, perhaps most daringly, Sharon Stone, a movie star not previously known for her musical gifts. On one track, over a mournful orchestral backdrop and Maalouf's trumpet, Stone recites an original poem, an angry address to an unnamed American politician (we all know who).

Maalouf approached Stone, he said, because he admires her "strong voice" and her willingness to speak her mind even at the risk of sounding "stupid." He had wanted a Hollywood figure to help close the album, which begins with an audio clip of Charlie Chaplin's final speech from "The Great Dictator." The film, with its plea for tolerance and "universal brotherhood," had made an impression on Maalouf when he first saw it, in grammar school, as the only Arab in his class.

"When I do a concert, I like that there are all kinds of people listening to me, even people who don't believe in the same things as me," he said. "If they're moved, then we've shared something." Would he welcome even Marine Le Pen or Donald Trump as a fan? "Why not?" he said. "Sometimes little things can change opinions on big things. Maybe they would have some part of their mind that thinks, Maybe, you know, maybe—*maybe*—I'm wrong." ♦

By Thomas Beller

By Isaac Chotiner

By Eli Coyote Mandel

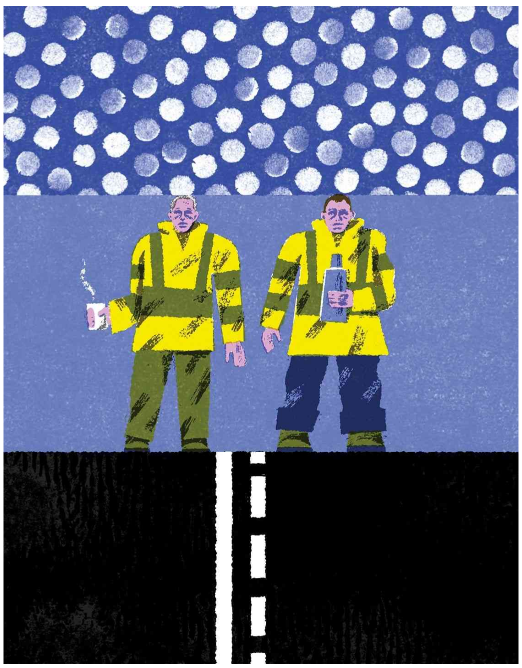
The Theatre

- **“Evanston Salt Costs Climbing,” a Pitch-Dark Comedy About Municipal Workers on the Brink**
- **“Some Like It Hot” Dresses Up for Broadway**
- **Celebrating the Holidays in N.Y.C.**

“Evanston Salt Costs Climbing,” a Pitch-Dark Comedy About Municipal Workers on the Brink

Will Arbery tackles the climate crisis with a funny nightmare about human and environmental fragility.

By Helen Shaw



There are four vibrant actors in Will Arbery’s bracing play “Evanston Salt Costs Climbing,” at Pershing Square Signature Center, but the show also has two stars *not* listed in the program: a pair of immense garage doors. The designer Matt Saunders has filled the proscenium, from the floor to the grid, with a huge wall—an expanse of what looks like corrugated steel pierced by those twin roll-up garage doors, with a single human-size door standing between them. This is the industrial warehouse where the city of Evanston, Illinois, keeps its piles of road salt, but it’s also where the audience stores its dread. The doors grind up and down, slow-opening mouths that reveal an interior as black as a throat. (Isabella Byrd lit the darkness; Mikaal Sulaiman did the chill-inducing sound design.) There’s a thin strip of playing area in front of the wall, where the characters—most of them employees of the

Evanston municipal-works department—can stand and chat, and some scenes happen on black platforms inside the warehouse. But, even when the gates are rolled down tight, you sense the pull of that cold, lightless abyss behind them, dragging at the characters' fragile human warmth like the vacuum of space.

"Evanston Salt Costs Climbing" tells the tale of three frozen Januaries—2014, 2015, 2016—and of the two guys who drive Evanston's salting truck, the mentally unstable Peter (Jeb Kreager) and the secretive Basil (Ken Leung). Their casting is canny: Kreager played a creepy cop on "Mare of Easttown"; Leung starred on "Lost" for years. "Evanston" exists somewhere between those two shows, toggling from "Easttown" 's gritty, wintertime realism to "Lost" 's Manichaean, allegorical menace.

Arbery is the playwright of the moment—both our fascism-adjacent political one and the global-existential climate-crisis one. He was a Pulitzer Prize finalist in 2020 for "Heroes of the Fourth Turning," his portrait of the right-wing faithful; this production, staged by the New Group and directed by Danya Taymor (she also directed "Heroes"), is the second major production of his to appear in New York this year. ("Corsicana" was at Playwrights Horizons over the summer, and its relative sweetness might linger for some audiences.) Taken together with his more experimental play "Plano," these works display the components of the Arbery style. He employs a sense of the hidden, whether as a supernatural presence or as some coincidence that goes beyond the rational. He's rhythmically very free, switching between long stretches of text, realistic talk, and rapid, language-as-sound exchanges. And there's a single drumbeat driving his work: things are bad, the badness is out there, and, sorry to say, the badness is getting closer.

Taymor, as before, explores all Arbery's delicate shadings. Peter and Basil communicate in a shorthand built during their long nights on the roads, and the wonderful Leung and Kreager infuse a few pages of sophomoric back-and-forth ("Fuck you. No fuck you ha-ha") with complex dramatic layers. Their boss, "assistant public works director in charge of city snow removal operations" Jane Maiworm (Quincy Tyler Bernstine, honored by the Obies in 2019 for sustained excellence), likes to pop by in the predawn hours before the men head out on their rounds. She rallies their spirits and reads them articles from the local paper. Will the climbing salt costs lead to

layoffs? Are the roads safe? Maiworm is the conscience of the play, ready to defend her incremental, effortful, impossible work, even when she's challenged on it. "Administration is *service!* Every day! That's what I *do!* " she cries.

Maiworm has an adult stepdaughter, Jane Jr. (Rachel Sachnoff), who lives on a narrow ledge between debilitating anxiety and function, and she panics when her mother leaves her alone. "There's something under everything and it's making us all want to die," she says, in one of Sachnoff's most gripping scenes. Peter, too, senses this awful psychic pressure, and his joshing exchanges with Basil in their truck's cab—they have a hilarious bit about the heat finally coming on and not wanting to "over-celebrate," since it might offend the truck—cannot keep his depression at bay.

> P*ETER:* Thanks for trying to cheer me up but it takes a while to sink in. My toes are cold.
>
> B*ASIL*: It's a cold day.
>
> P*ETER*: Negative seventeen. Butta time. Suppa time for us. Butta time.
>
> B*ASIL*: Butta time.
>
> P*ETER*: Okay but have you thought about what it would be like to die?
>
> B*ASIL*: Like what, or like what, the feeling?
>
> P*ETER*: The feeling, yeah, of the dying, when it happens, what's going on in your heart or brain.
>
> B*ASIL*: Peter, are you asking me to go down into that feeling with you?

Everybody's scared. Maiworm is having horrible dreams about paving options. Basil misses his home in Greece, which he left for an unnamed reason, one possibly illuminated by the eerie short stories he writes. But Peter is the one who hums with threat. One moment, he's talking about an innocent enthusiasm, like the Domino's pizza tracker; the next, his overloaded emotional system throws off sparks. Melancholy is slow-creep contagious, but Peter also conveys a sense of immediate, crackling danger.

Kreager is tall, and he uses his height effectively—he looms up suddenly next to Leung, like a tree that's jumped in front of a skidding car.

In a world of content warnings (one of which is included on the theatre's Web site) and careful phrasing, Arbery's bleakness and frank talk about the death urge are shocking. Characters connect because of shared hallucinations or coinciding suicidal thoughts. "You aren't actually gonna kill yourself silently one night outta nowhere," Peter says to Jane Jr., even though we have been worried about his capacity for self-harm for nearly the entire show. Perhaps one just likes "looking at the shadow body of it," he suggests, elliptically, and the play prompts just this sort of Greek-tragedy-style catharsis—of watching people say and think the worst, knowing that it isn't real.

"Evanston" premièred in Massachusetts in 2018, but it somehow contains much of the desperation of the past three destabilizing years: there isn't a flicker of sunshine in it, even though Arbery is reliably funny and, in an upside-down way, galvanizing. He broaches a host of hyper-relevant issues: a climate that grows less clement every year, the biome-destroying potential of road salt ("That's what happens to bunnies in the winter. They eat salt and die confused," Maiworm says), American municipal underinvestment, untreated mental illness. Maiworm is a devotee of the urbanist Jane Jacobs. (This is the play's third Jane; Fates, Graces, and Furies also come in threes.) She gives Jacobs's book "The Death and Life of Great American Cities" to the guys. Basil has memorized a quote, which he recites for Jane Jr.: "There is a quality even meaner than outright ugliness or disorder, and this meaner quality is the dishonest mask of pretended order."

Arbery's project as a playwright is to yank away that "dishonest mask of pretended order," using the means he has at hand—the empathetic tools of performance and the electrifying effects of wild unreality. Some very odd things happen in the deep nights and early mornings of "Evanston Salt Costs Climbing": figures escape from nightmares, the dead climb up from underneath the asphalt, people take comfort, paradoxically, in despair.

The reason for this, I think, is that Arbery is writing about issues that tend to lead to indulgent hopelessness. Look at what we're doing to the earth, we think—well, it's too far gone now to do anything. But what if looking right

into the heart of catastrophe could actually get us to act? In “Evanston,” something pulsing and dark and Lovecraftian wants us dead—got it. The weather is getting worse—*got it*. But Maiworm is certainly still going. What’s so scary about some garage doors in the face of her sturdy labor? You couldn’t make this point so well without Bernstine in the role. As she has done in countless beautiful performances, she anchors the show with her wry, rasping voice and her refusal to sentimentalize. At one point, she struggles in a gale against the screaming wind. She hasn’t got her parka; she’s vulnerable. But I tell you—I wouldn’t bet on the wind. ♦

By Janet Malcolm

By Robert A. Caro

By Patrick Radden Keefe

By Philip Gourevitch

“Some Like It Hot” Dresses Up for Broadway

A new musical, based on Billy Wilder’s classic man-in-a-dress comedy, splices old-school fun with contemporary gender politics.



The man-in-a-dress comedy is one of Hollywood’s hoariest genres and, in recent years, fodder for Broadway musicals (“Tootsie,” “Mrs. Doubtfire”). But it all traces back to **“Some Like It Hot,”** Billy Wilder’s classic film from 1959. A new musical version, in previews at the Shubert, with direction by Casey Nicholaw and songs by Marc Shaiman and Scott Wittman (“Hairspray”), aims to splice the old-school fun with contemporary gender politics. Adrianna Hicks, J. Harrison Ghee, and Christian Borle (above, left to right) lead the cast.

By Michael Schulman

By Jay Ruttenberg

By Marina Harss

Baroque Neapolitan Crèche

Below the choir of angels that's decorating the twenty-foot-tall spruce in the Met's Medieval Hall is a Nativity scene, crafted by Italian artisans in the eighteenth century, which calls to mind both Biblical Bethlehem and a jubilant prequel to Elena Ferrante's Neapolitan novels, as exquisite polychrome figurines of the Holy Family, the Magi, and the shepherds are joined by others representing the vibrant street life of Naples. *(The Met; through Jan. 8.)*

Gingerbread NYC

In early November, the Museum of the City of New York pulled a Paul Hollywood and hosted the first Great Borough Bake-Off, in which amateurs and professionals alike competed. (Somewhere Sinatra is singing, "If you can bake it there, you'll bake it anywhere.") The winners—including confectionary homages to the Staten Island Ferry, a Brooklyn brownstone, and the elevated subway in Queens—are now on view. *(Museum of the City of New York; through Jan. 8.)*

Holiday Train Show

To see Yankee Stadium, you head to the Bronx, where you don't expect to see the Brooklyn Bridge or the Statue of Liberty. But, at the Bronx's New York Botanical Garden, some twenty-five model trains and trolleys whiz past almost two hundred New York City landmarks—enchanting miniatures, meticulously constructed from bark, moss, and load-bearing cinnamon sticks —in the Enid A. Haupt Conservatory. *(New York Botanical Garden; through Jan. 16.)*

"George Balanchine's The Nutcracker"

When Balanchine created "The Nutcracker" for New York City Ballet, in 1954, he drew from childhood memories of the version in which he had danced in St. Petersburg, before the Revolution. His part was in the "hoop dance" (in a role now known as Candy Cane), a virtuosic jumping number set in the Land of the Sweets. (Balanchine kept the original choreography.) He had the excellent idea of filling the ballet with children, including its two protagonists, Marie and the Nutcracker Prince. Last year, because of vaccination issues, the kids were a little older, but this year they once again range from eight to thirteen. *(David H. Koch Theatre; Nov. 25-Dec. 31.)*

Kiki and Herb: "Do You Hear What We Hear?"
The twisted cabaret dynamos Kiki and Herb were never exclusively Christmastime visitors, but the holiday has long factored into their myth. In 2021, the duo—the singer Justin Vivian Bond as Kiki and the pianist Kenny Mellman as Herb—revived their seasonal show for the first time in more than a decade; for a segment of the downtown populace, natural order was restored. Now Kiki and Herb embark on a brief tour that stops at the Beacon; it's followed by a run of Bond's solo show, "Oh Mary, It's Christmas!," at Joe's Pub (Dec. 16-23). *(Beacon Theatre; Dec. 3.)*

Jingle Ball 2022
The artists may be young and contemporary, but iHeartRadio's annual holiday blowout is a brazenly old-fashioned event, down to its association with an entity that many attendees may hardly recognize—a radio station. As in years past, the program draws from some of the moment's shiniest pop stars, including Dua Lipa, Lizzo, Charlie Puth, and Demi Lovato, along with the antediluvian Backstreet Boys. But the true stars of the night might prove to be the teenyboppers in the audience, screaming their little heads off. *(Madison Square Garden; Dec. 9.)*

"Peter and the Wolf"
This tale, about a boy who defies a warning not to go out into a meadow, only to encounter a hungry wolf, originated as a Soviet lesson about youthful resourcefulness. Sergei Prokofiev, who set it to music, cleverly fashioned it as an introduction to the orchestra. In this charming half-hour production, for "Works & Process," narrated by the avuncular Isaac Mizrahi, with witty choreography by John Heginbotham, Central Park stands in for the Russian meadow. *(Guggenheim Museum; Dec. 10-11.)*

Winter Family Fair
'Tis the season for the Morgan Library to display a page from its original manuscript of Dickens's holiday classic, "A Christmas Carol." This year, additional inspiration for the child-friendly activities at the museum's annual event is provided by a trio of concurrent shows, devoted to "The Little Prince," to the Mesopotamian poet Enheduanna, and to the 2015 book "Sail Away," which pairs poems by Langston Hughes with collages by Ashley Bryan. *(Morgan Library & Museum; Dec. 11.)*

New York Philharmonic

John Williams's film scores for the Harry Potter movies begin with a melody that opens a portal to a young wizard's magical world, but the twinkling celesta and rushing strings could just as easily conjure the wonder of the holiday season—the very sound of tinselly snowflakes carried aloft on a wintry gust. The New York Philharmonic provides live accompaniment for a screening of "Harry Potter and the Chamber of Secrets" (Dec. 20-23); for the more traditionally inclined, there's Handel's "Messiah" (Dec. 13-17) and the brass players' annual holiday concert (Dec. 16-17). *(David Geffen Hall.)*

"Unsilent Night"

This year marks the thirtieth anniversary of "Unsilent Night," the perfect carolling option for those who cringe at the thought of singing in public. A sort of pre-Internet flash mob, the piece is the handiwork of the composer Phil Kline, who greets attendees at the Washington Square Arch with boom boxes loaded with different parts of his instrumental composition. (There's also an app.) After hitting Play, participants stroll to Tompkins Square Park. Last year, "Unsilent Night" fell during peak Omicron, making the outdoor happening the only palatable concert in town, and, year in, year out, it never fails to warm hearts on a cold night. *(Washington Square Park; Dec. 18.)*

"New Year's Eve Concert for Peace"

At the magnificent Cathedral of St. John the Divine, Kent Tritle and Bryan Zaros conduct the cathedral's forces in a program that runs the emotional gamut. Gustav Holst's uplifting, warmly orchestrated "St. Paul's Suite" appears alongside David Lang's "Make Peace," a clear-eyed plea arranged for a-cappella choir, and Philip Herbert's tearful "Elegy: In Memoriam Stephen Lawrence." Joseph Turrin's "Lullaby for Vaska," dedicated to the Ukrainian people, has its world première. *(Cathedral of St. John the Divine; Dec. 31.)*

By David Remnick

By The New Yorker

By The New Yorker

By Keith Gessen

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